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AUTHOR Switzky, Harvey N.
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ABSTRACT

This review covers the psychological literature of the last 30 years regarding the personality and motivational characteristics of individuals with mental retardation. The first section is a brief historical review and critical examination of the various conceptual models and theories regarding personality and motivational processes in persons with mental retardation. The second section primarily addresses the implications of current mainstream psychological conceptions and theories regarding personality and motivational self-system processes for persons with mental retardation, including implications for individual educational programming. The third section provides a synthesis of the first two sections and provides an agenda for future research. The following models are reviewed: the rigidity hypothesis, social learning theories, self-concept theories, anxiety theories, and effectance motivation and intrinsic motivation theories. Consideration is also given to goal setting and goal value, self-efficacy, autonomy and self-determination, and intrinsic motivation and cognitive processes. (Contains approximately 360 references.) (SW)

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Chapter 15

Individual Differences in Personality and Motivational Systems in Persons with Mental Retardation

Harvey N. Switzky

Northern Illinois University

EC 303937

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Introduction

This review is designed to guide the reader through the psychological literature of the last 30 years regarding the personality and motivational characteristics of individuals with mental retardation, i.e., the period extending from the first and second editions of the Handbook of Mental Deficiency (Ellis, 1963, 1979) to the current psychological zeitgeist. It is a very selective review and is divided into three major sections. The first section is a brief historical review and critical examination of the various conceptional models and theories regarding personality and motivational processes in persons with mental retardation. The second section is primarily concerned with the implications of current mainstream psychological conceptions and theories regarding personality and motivational self-system processes for persons with mental retardation. The third and final section attempts to provide a synthesis of the first two sections regarding a theoretical model of personality and self-system processes for persons with mental retardation and tries to provide an agenda for future research. Considering the broadscope of this review it cannot be exhaustive. but will reflect the idiosyncracies of the author.

I. Individual Difference Variables in Mental Retardation Research: A Brief History and Critique

Early conceptions of personality and motivational process in persons with mental retardation prior to the period of the 1960's were only loosely related to theoretical models derived from mainstream psychological thought and virtually none of the models were based on any sustained systematic study of the behavior of mentally retarded persons themselves. Researchers were concerned primarily with the role of cognitive processes and the differences in performance between persons with mental retardation compared to persons without mental retardation on different learning tasks in an attempt to identify the deficits which were believed to characterize persons with mental retardation. Concern with developmental and personality/motivational processes per se, were deliberately ignored and viewed more as confounding variables needing to be controlled so as to allow the researchers to more clearly focus on the infinitely more important cognitive and learning processes (Haywood & Switzky, 1986; Hobbs, 1963; Hodapp, Burack, & Zigler, 1990; Lipman, 1963). Over the last

thirty years there has a veritable explosion of knowledge concerning persons with mental retardation from more of a holistic, developmental, motivational, and cognitive perspective (Balla & Zigler, 1979; Haywood & Switzky, 1986 Merighi, Edison, & Zigler, 1990; ; Zigler & Hodapp, 1991). A perspective which recognizes that the performance of persons with mental retardation reflects the complex interplay of personality and motivational processes with cognitive processes within a developmental perspective (Borkowski, Carr, Rellinger, & Pressley, 1990; Borkowski, Day, Saenz, Dietmeyer, Estrada, & Groteluschen, 1992; Haywood & Switzky, 1992; Haywood, Meyers, & Switzky, 1982; Switzky & Haywood, 1984; Switzky & Heal, 1990). This point of view not only reflects a new conception of mental retardation but also reflects mainstream psychological thought concerning the development of human beings as active problem solvers (Leeper & Hodell, 1990; McCombs & Marzano, 1990; Paris & Newman, 1990; Sternberg & Berg, 1992; Stipek, 1993; Zimmerman & Schunk, 1989). The author views these trends as reflecting the accelerating integration between a psychology of mental retardation, and a developmental psychology of human growth for all human beings (Borkowski, et al., 1990; Feuerstein, Klein, & Tannenbaum, 1991; Haywood & Tzuriel, 1992; Nicholls, Cheung, Lauer, & Pastashnick, 1989; Paris & Winograd, 1990; Pintrich & Schrauben, 1992).

Major historical attempts to conceptualize the behavior of persons with mental retardation in terms of personality and motivational constructs to explain the initiation, direction, intensity, and persistence of goal-directed behavior generally followed the current zeitgeist of whatever the dominant hypothetical constructs were in vogue in psychological thought at the time but "as through a glass darkly", since they were derived primarily from the behavior of nonretarded persons and often forced, extended, and revised in order to incorporate and explain "motivated" behavior in person with mental retardation. Sometimes these attempts lead to dead ends, while other attempts were quite systematic and fruitful of both psychological theory building and research related to a better understanding of the behavior of persons with mental retardation (Haywood & Switzky, 1986). The following models will be reviewed: (a) the rigidity hypothesis (Balla & Zigler, 1979; Balla, Butterfield, & Zigler, 1974; Bybee & Zigler, 1992; Lewin, 1936; Kounin, 1941a, 1941b; Harter & Zigler, 1968; Lustman & Zigler, 1982; Zigler, 1961; Zigler, Butterfield, & Goff, 1966); (b) social learning theories (Atkinson, 1964; Balla & Zigler,

1979; Bialer, 1961; Cromwell, 1963, 1967; Covington, 1987; Gruen & Zigler, 1968; Harter & Zigler, 1972; Haywood & Switzky, 1986; Hoffman & Weiner, 1978; Horai & Guarnaccia, 1975; Luthar & Zigler, 1988; MacMillan, 1975; McManis & Bell, 1968; McManis, Bell, & Pike, 1969; Miller, 1961; Moss, 1958; Rotter, 1954; Scwartz & Jens, 1969; Stevenson & Zigler, 1958; Weiner, 1986); (c) self-concept theories (Balla & Zigler, 1979; Collins & Burger, 1970; Glick & Zigler, 1985; Haywood & Switzky, 1986; Haywood, Switzky, & Wright, 1973; Leahy, Balla, & Zigler, 1982; Piers & Harris, 1964; Ringness, 1961; Switzky & Hanks, 1973; Zigler, Balla, & Watson, 1972); (d) anxiety theories (Balla & Zigler, 1979; Cantor, 1963; Castaneda, McCandless, & Palermo, 1956; Cochran & Cleland, 1963; Lipman, 1960; Lipman & Griffith, 1960; Zigler, 1966a); and (e) effectance motivation and intrinsic motivation theories (Harter & Zigler, 1974; Harter, 1983; Harter & Pike, 1984; Haywood, 1968a, 1968b, 1971, 1992; Haywood & Switzky, 1985, 1986; Hodapp et al., 1990; Switzky & Haywood, 1974, 1984; Switzky & Heal, 1990; Switzky, Haywood, & Isett, 1974; Switzky, Ludwig, & Haywood, 1979; Zigler, 1966b; Zigler & Balla, 1981, 1982; Zigler & Hodapp, 1991; White, 1959).

1. The Rigidity Hypothesis was one of the earliest formulations regarding the personality structure of persons with mild mental retardation. It derived from the work of Lewin (1936) and Kounin (1941a, 1941b) who viewed the structure of personality as developmentally dynamic and consisting of inner-personal regions of needs, skills, and habits of behavior. As the individual developed there was an increase in the number and the complexity of these inner-personal regions, a process called differentiation which corresponded with the mental age of the individual. The boundaries of each inner-personal region were viewed as also varying in permeability which allowed information to communicate and flow throughout the whole personality structure. As an individual matured it was believed that the boundaries between inner-personal regions became less permeable, a quality referred to as rigidity. To account for the deficient performance of persons with psychosocial mental retardation compared to persons without mental retardation even when matched on mental age (which controlled for the amount and degree of differentiation of cognition) on different laboratory learning tasks, Lewin and Kounin believed that the personality structure of persons with mental retardation was fundamentally different from nonretarded persons. The boundaries between the inner-personal regions of mentally retarded

persons were believed to be less permeable and more rigid accounting for the greater perseveration, concreteness, and sterotypic performance observed in the mentally retarded samples. In general, retarded persons appeared to be less inclined to abandon unproductive ideas or unsuccessful strategies in favor of potentially more productive ones than were nonretarded persons (Haywood & Switzky, 1986).

The Lewin-Kounin studies provided a spring-board for the most systematic, successful, and sustained series of studies over the last 30 years emphasizing that the behavior of persons with mental retardation is not primarily due to a fundamentally different and defective personality structure but to overlooked motivational and environmental variables existing between persons with and without mental retardation, the work of Edward Zigler and his colleagues from Yale University, the Yale Group (Balla & Zigler, 1979; Hodapp et al., 1990; Merighi et al., 1990; Zigler, 1966b; Zigler, 1971; Zigler & Balla, 1982). In essence the behavior observed in psychosocial mentally retarded persons was hypothesized to be due to: (a) their history of repeated failure in attempting to cope with their life experiences; (b) their chronic social deprivation: caused by a lack of continuity of care by parents or caretakers, an excessive desire by parents to separate from or institutionalize their child, an impoverished economic circumstances, and/ or a family history of marital discord, mental illness, abuse, or neglect, and the experience of living in regimented, harsh, and joyless institutional settings; (c) their history of chronic disapproval by parents, siblings, and other important social agents in their social world; (d) as well as their cognitive deficiencies and inefficient learning.

As the result of the operation of these environmental variables the personality and motivational characteristics in persons with mental retardation has been characterized by the Yale Group, in terms of the following constructs: (a) positive reaction tendencies and overdependency; (b) negative reaction tendencies and weariness; (c) expectancies of success and failure; (d) outerdirectedness; (e) effectance motivation, and intrinsic vs extrinsic motivation; (f) self-concept deficiencies; and (g) high anxiety. The Yale Group's system combines and is derived from themes emanating from social learning models, theories of effectance and intrinsic motivation, as well as self-concept and anxiety theories.

A. Positive Reaction Tendencies and Overdependency are the tendencies in persons with mental retardation to be overly dependent and highly motivated to sustain social interactions resulting in social reinforcement from supportive adults to a greater extent than observed in nonretarded persons of the same mental age.

B. Negative Reaction Tendencies and Weariness are the initial tendencies in persons with mental retardation to be reluctant, fearful, cautious, and mistrustful (i.e., weary) to socially interact with strange adults in their environment. Mentally retarded persons as a result of their histories of social deprivation appear to be motivated by strong ambivalent feelings to interact with supportive adults (manifest positive reaction tendencies) as well as a reluctance and caution to do so (manifest negative reaction tendencies and wariness). These initial tendencies toward wariness may be replaced by positive reaction tendencies toward adults as a result of a history of interaction where the adult is perceived as less threatening and harmful.

C. Expectancies of success and failure is the degree to which an individual expects to succeed or fail when presented with a new task. Generally persons with mental retardation have a higher expectancy to fail on a task compared to nonretarded persons. Stevenson and Zigler (1958) very early had proposed that because of the extreme failure experiences of children with mental retardation they would have a lowered expectancy of future reinforcement success compared to nonretarded children of the same mental age.

D. Outerdirectedness is a learning style of problem solving in persons with mental retardation characterized by a distrust of ones own inner-derived solutions to difficult problems which is replaced by an overreliance on imitating external mediators and generally seeking external stimulus cues as guides to problem solutions compared to nonretarded persons of the same mental age.

E. Effectance motivation, and intrinsic vs extrinsic motivation is associated with the pleasure and sustained performance individuals derive from using their own cognitive resources for their own sake and independence from environmentally derived external reinforcement (i.e., task-intrinsic motivation), usually in the domains of exploration, play, curiosity, and mastery of the environment. Individuals lacking in effectance motivation are characterized by being heavily dependent on receiving

environmentally derived externally-reinforcement feedback in order to perform a task (i.e., task-extrinsic motivation). Generally persons with mental retardation compared to nonretarded persons of the same mental age have less effectance motivation and more of an extrinsic motivational orientation leading to different patterns of incentives and reinforcement hierarchies for persons with mental retardation compared to nonretarded persons. (See the research of Haywood and the Peabody-Vanderbilt Group which has worked extensively in expanding our conceptions of effectance motivation, and intrinsic vs extrinsic motivation (which they have called motivational orientation) as applied to retarded and nonretarded individuals).

F. Self-concept as viewed by the Yale Group is viewed developmentally as a set of self-images: (a) the real self-image, i.e., the person's current self-concept; (b) the ideal self-image, i.e., the way the person would ideally like to be; and (c) the self-image disparity, i.e., the difference between the real self-image and the ideal self-image. According to developmental theory (Glick & Zigler, 1985), the difference between the person's real self-image and ideal self-image becomes greater with higher levels of development. This is assumed to occur because higher levels of development lead to increasing cognitive differentiation. This greater cognitive differentiation results in a greater likelihood for disparity between an individual's conceptualization of the real self and the ideal self. Additionally, because an individual's capacity to experience guilt increases developmentally as the individual incorporates social demands, mores, and values, the individual must measure up to many more internalized demands, and these greater self-demands and the guilt that accompanies them should be reflected in a greater disparity between real and ideal self-images. The expectation is that when retarded and nonretarded children are matched both on mental age and chronological age, retarded children will have lower ideal self-images and lower self-image disparities than nonretarded children because of the extensive history of failure experiences and low expectancy of success in retarded children. These ideas are very similar to Markus' theory of "possible selves", Markus & Nurius (1986), which has been recently applied by Borkowski, et al. (1992) as motivational operators which energize metacognitive self-system processes in nonretarded children. For the most part, these expectancies regarding the self-concept of children

with mental retardation were confirmed in research studies (Leahy, Balla, & Zigler, 1982; Zigler, Balla, & Watson, 1972).

G. Anxiety levels of persons with mental retardation have been shown to be higher than their nonretarded chronological age and mental age match. These high anxiety levels observed in persons with mental retardation because of their history of social deprivation and repeated failure in attempting to cope with their life experiences may depress even more their ability to solve problems in school, at work, and in the community.

The work of the Yale Group over the last thirty years has magnificently and systematically demonstrated the interaction of experiential, motivational, and personality processes in persons with mental retardation as it effects all aspects of their daily life experiences. Their work has operated to emphasize the operation of motivational processes and attempted to provide some counter-balance to the field's historic research preoccupation solely with the role of cognitive processes in accounting for the behavior of retarded persons.

2. Social Learning Theories initially developed in order to explain the acquisition of socially relevant behaviors mediated by the operation of a set of internal cognitive processes rather than through the operation of isolated stimulus-response externally-reinforced behavioral contingencies. Rotter (1954), one of the early social learning theorists emphasized the individual's cognitive expectancies (beliefs) concerning the occurrence of reinforcing events (the contingencies of reward) in the individual's social world as well as the perceived value of these reinforcing events as determining the behavior of individuals. Expectancies were determined not only by beliefs about the occurrence of reinforcing events in a particular situation but also by generalized expectancies concerning the occurrence of reinforcing events in other similar situations. Rotter referred to an individual's generalized expectancies (beliefs) regarding the occurrence of reinforcing events (the contingencies of reinforcement) as their locus of control. Locus of control referred to the extent to which an individual believed that one's own behavior (e.g., hard work) or a relatively permanent personal characteristic (e.g., physical strength), can be instrumental in determining what happened to one's self (internal locus of control), as opposed to the extent to which an individual believed that what happened to one's self

was random (e.g., luck, chance, fate) or under the control of external persons (e.g., biased others), examples of an external locus of control.

Another construct deriving from Rotter was the notion of success-striving versus failure-avoiding motivational expectancies in individuals. An individual with a high generalized expectancy for success, the success-striving individual, would be primed to respond primarily to cues in the social environment which would lead to continued success. An individual with a low generalized expectancy for success, the failure-avoiding individual, would be primed to respond primarily to cues in the social environment which would lead to the prevention of additional failure. In essence such an individual would stop trying to be successful as a general motivational orientation. Instead, such an individual would be primarily concerned with the prevention of additional failure.

Rotter's (1954) version of social learning theory greatly influenced the work of Rue Cromwell (1963, 1967) and his colleagues (Bialer, 1961; Miller, 1961; Moss, 1958) in their application and extension of social learning theory to the personality and motivational processes of persons with mental retardation. In general, (Cromwell, 1963; Haywood & Switzky, 1986) mentally retarded person were found to be more characterized by: (a) an external locus of control and failure-avoiding motivational expectancies compared to nonretarded persons, i.e., mentally retarded persons had stronger tendencies to be failure avoiders than success strivers, (b) entered a novel situation with a performance level which was depressed below what would be expected in terms of their psychometric mental age and intelligence, (c) had fewer tendencies than nonretarded persons to increase effort following a mild failure experience, and (d) generally had fewer tendencies to be "moved" by failure experiences than nonretarded persons. An internal locus of control developed as a joint function of both mental and chronological age and was positively correlated with task persistence and learning efficiency. MacMillan and his colleagues (MacMillan & Keogh, 1971) in a series of studies showed that mentally retarded children were dominated more by feelings of failure compared to nonretarded children. In these studies, the children were prevented from finishing several tasks and then asked why the tasks were not completed. Children with mental retardation consistently blamed themselves for the lack of task

completion compared to the nonretarded children who blamed their failure on external causes but not to themselves as persons.

Atkinson (1964) another early social learning theorist derived an expectancy x value model of behavior based on an individual's unconscious expectancies for success (the motive for success or need to achieve), or an individual's unconscious expectancies for failure (the motive to avoid failure) in accomplishing the task, and also on an individual's conscious beliefs about that particular situation (i.e., the perceived probability of success associated with the expectations to feel proud, the incentive value of success, and the perceived probability of failure associated with the expectations to feel shame, the incentive value of failure). The tendency to approach a task was determined by an unconscious personality factor (the motive for success or need to achieve) and two conscious situational factors (expectations for success and pride). The tendency to avoid a task was determined by an unconscious personality factor (the motive to avoid failure) and two conscious situational factors (expectations for failure and shame). The resultant tendency to approach or avoid a task was a function of the tendency to approach minus the strength of the tendency to avoid the task. The tendency to approach a task was a multiplicative function of the motive for success X the perceived probability of success X the incentive value of success. The tendency to avoid a task was a multiplicative function of the motive to avoid failure X the perceived probability of failure X the incentive value of failure.

Theories of achievement motivation derived from Atkinson's model were based on the idea that the need for achievement is derived from a conflict between striving for success and a need to avoid failure. Individuals showed extreme individual differences in the ways they resolved this conflict (Covington, 1987): (a) some approach success despite the risk of failure; (b) some act defensively to avoid failure with its implications for low ability. Success-oriented persons with strong needs to achieve prefer achievement tasks where the probability of success is equal to the probability of failure thus assuring themselves of sufficient successes to sustain further effort with out too easy a victory. Failure-prone persons with strong needs to avoid failure prefer achievement tasks that are either too easy or too difficult, thus increasing the probability of success in the former case, and establishing excuses in advance for failure in the latter case.

Atkinson's (1964) version of social learning theory also influenced mental retardation researchers (McManis & Bell, 1968; McManis , Bell, & Pike, 1969; Schwarz & Jens, 1969). However much of this work in this particular form lead to inconsistent results and was never followed up by other researchers in mental retardation. Atkinson's ideas concerning an individual's performance as being dependent on personality factors, expectations concerning success and failure, and emotional states profoundly effected later motivational theorists which built upon and extended his work (Ames & Ames, 1984, 1985, 1989; Borkowski et al., 1992; Covington, 1987; Deci & Ryan, 1985, 1991; Dweck, 1989; Heckhausen, 1983; Maehr & Pintrich, 1991; Nicholls, 1989; Zimmerman & Schunk, 1989).

A more fruitful line of research based on the zeitgeist of early social learning models focused on the effects of success and failure expectancies on problem-solving behavior. Typically a probability learning paradigm was used which is a variant of a three-choice discrimination problem in which one stimulus is partially reinforced (usually 66% of the time) and the other two stimuli are never reinforced. Thus the subject is faced with an insoluble problem, i.e., they can never be correct 100% of the time. If an individual persistently chooses a partially reinforced stimulus, the individual is using a maximizing strategy of reinforcement success. It has been hypothesized that children with mental retardation because of their low expectancies of success are more likely to use a maximizing strategy than children with higher expectancies of success. Children with higher expectations of success believe that the problem has a solution and that they can be successful all of the time, so they tend not to use a maximizing strategy. It has been shown that retarded children are found to use more maximizing strategies than nonretarded children (Gruen & Zigler, 1968; Stevenson & Zigler, 1958).

Weiner (1986) building on the work of Rotter (1954) and Atkinson (1964) developed a cognitive model of need for achievement and the behavior of success-striving, success-oriented individuals and failure-avoiding, failure-prone individuals, based on the individuals' own interpretations of the causes which they attributed for their own success or failure experiences. Weiner expanded Rotter's single internal-external locus of control dimension into three separate dimensions: locus, stability, and control. The locus dimension referred to the source of the cause of the behavior, i.e., whether the behavior was due to internal causes or external causes. The stability dimension referred to the relative permanence

or impermanence of the cause of the behavior, i.e., ones' ability level was viewed as relatively permanent, whereas ones' effort, luck, or mood were viewed as more labile. The control dimension referred to the perceived amount of control an individual has over the cause of the behavior, i.e., one can control the amount of effort expended on a task, however one has no control regarding luck on a task. In general, failure-prone individuals attributed their failures to a lack of ability (a permanent quality) and ascribed their successes to impermanent external causes such as positive teacher bias, good luck or an easy task, whereas success-oriented individuals ascribed their poor performances to lack of effort, an impermanent quality (Covington, 1987).

Weiner's attributional theory (Weiner, 1986) has inspired some studies with mentally retarded persons. Horai and Guarnaccia (1975) gave a coding task under success feedback (subjects were informed that they had done well), and failure feedback (subjects were informed that they had done poorly and that others had done much better), experimental conditions to male mildly mentally retarded adults from a community-based training center. Horai and Guarnaccia (1975) interviewed them with an exhaustive forced-choice procedure to determine their attributions of success or failure (ability, effort, task difficulty, or luck). It was expected that mentally retarded persons because of their history of failure would have cognitive attributions similar to those associated with a failure-prone cognitive orientation: (a) they would under failure feedback make more attributions to lack of ability than attributions under success feedback, and (b) they would under success feedback make more attributions to increased effort than attributions to lack of effort under failure feedback.

Successful subjects were found more likely to credit their high ability for their performance than were failure subjects to credit their low ability for their failure. Failure subjects were more likely to blame their lack of effort than were successful subjects to say that they tried harder on the task. Failure subjects were more likely to attribute their failure to bad luck than were successful subjects to attribute their success on the task to good luck. There were no differences in attributions to task difficulty between the two groups. This study demonstrated that Weiner's attribution theory could be applied to mentally retarded adults, that the attributions of mentally retarded adults could be assessed, and that contrary to the expectation that <u>all</u> mentally retarded persons show homogeneous personality structures

as regards their reactions to success and failure experiences, i.e., in this case they would use the attributions predicted for failure-prone individuals, the mentally retarded persons in this study functioned more like success-oriented individuals (they attributed success to ability and failure to lack of effort and bad luck). This study showed that contrary to Cromwell's (1963) generalization that mentally retarded persons expect failure and have fewer tendencies to be "moved by it" than nonretarded persons, mentally retarded persons show great individual differences in their responses to success and failure.

Hoffman and Weiner (1978) performed a partial replication of the Horai and Guarnaccia (1975) study on a group of "TMR adults" using a coding task to give success and failure experiences. This study used three casual attributions (ability, effort, and task difficulty). It was found that these moderately retarded adults behaved to the success and failure feedback in a most realistic manner similar to the pattern observed in nonretarded adults. The learning and performance of persons with mental retardation can be facilitated if adaptive attributions are combined with outcome information leading to a pattern of cognitive attributions ascribing high ability for success feedback and ascribing lack of effort for failure feedback. Both these studies show that the state of being mentally retarded does not inevitably lead to a failure-prone cognitive orientation and that one must be cognizant of the variety of individual differences existing in mentally retarded persons. Only a subset of persons with mental retardation have been found to make attributions that are counterproductive to achievement strivings (Zoeller, Mahoney, & Weiner, 1983).

Social learning theories have provided a fruitful model for our understanding of the motivational systems of persons with mental retardation. Social learning approaches have evolved considerably over the last 30 years influencing research with both mentally retarded and nonretarded populations.

3. Self-concept Theories have increasingly dominated mainstream psychological research from the decade of the 1940's (Rogers, 1947; Snygg & Combs, 1949) to the present period (Harter, 1983; Leahy, 1985, McCombs, 1988, 1989; McCombs & Marzano, 1990; McCombs & Whistler, 1989; Zimmerman & Schunk, 1989) in spite of the lack of research instruments having adequate reliability and construct validity. Research on the self-concept of mentally persons has been sparse and inconsistent because of these very same reasons which are heavily compounded because of the extreme difficulty

of studying populations limited so much in verbal behavior (Balla & Zigler, 1979; Haywood & Switzky, 1986).

It might be expected that persons with mental retardation because of their long history of failure and lack of success, stigmatization, rejection, and cognitive deficiencies would have lower self-concepts and extreme negative self-perceptions compared to nonretarded persons (Balla & Zigler, 1979; Covington, 1987; Haywood & Switzky, 1986; Merighi et al., 1990). This expectation has only been partially supported.

Collins and Burger (1970) found no overall differences in self-concept between mildly retarded and nonretarded adolescents. Piers and Harris (1964) suggested that there might be a positive correlation between self-concept and measured intelligence. Their mentally retarded groups scored significantly lower on the Piers-Harris Children's Self-Concept Scale than either third or sixth grade subjects of normal intelligence. They also found that in their nonretarded subjects of higher psychometric intelligence and academic achievement more positive self-concepts. Similarly, Gorlow, Butler, and Guthrie (1963) found that their mentally retarded adolescents who scored lower on three self-concept scales also scored lower on the WAIS, California Achievement Test, and on a measure of arithmetic achievement.

Ringness (1961) found that mildly mentally retarded children tended to overestimate their own success more than did average or intellectually superior children. The mentally retarded children rated themselves less favorably than did those in the intellectually superior group but not less favorably than did those in the average group. Self-concept measured as expectancy of success in mentally retarded children was found to be less realistic, in terms of actual achievement, than in the nonretarded children. It was also found that the self-concept ratings of mentally retarded children were found to be less reliable than for average or intellectually superior children.

Haywood, Switzky, and Wright (1974) and Switzky and Hanks (1973) reported on a set of studies trying to relate vocational training success (as measured by Supervisor's Rating and production rates of subjects) to personality and intelligence measures in a group primarily consisting of 67 mildly mentally retarded adults. Each subject was given a battery of nine instruments: (a) The Tennessee

Self-Concept Scale, Clinical and Research Form (Fitts, 1965)-a global self-concept measure, (b) The Junior Eysenck Personality Inventory (Eysenck, 1965)-a measure of extraversion/introversion and neuroticism/emotionality, (c) The Piers-Harris Children's Self-Concept Scale (Piers & Harris, 1969)-a global self-concept measure, (d) The Children's Personality Questionnaire (Porter, Cattell, & Ford, 1968)-a global personality measure, (e) The Children's Locus of Control (Bialer, 1961), (f) Miller's Adult Locus of Evaluation (Miller, 1965)-a measure of the individual's reliance on one's self (internal) or others (external) in evaluating one's own performance, (g) The Raven Coloured Progressive Matrices (Raven, 1956) and The Raven Standard Progressive Matrices (Raven, 1960)-a measure of cognition, (h) The Matching Familiar Figures (Kagan, 1964)-a measure of impulsivity/reflectivity, and (i) The Picture Motivation Scale (Kunca & Haywood, 1969)-a measure of intrinsic/extrinsic motivational orientation. Together The Piers-Harris Children's Self-Concept Scale, The Raven Progressive Matrices, The Matching Familiar Figures, and age accounted for 41 percent of the variance in Supervisor's Rating (R=.64, p<.001). For 27 subjects, both Supervisor's Ratings and production rates were available. Production rates correlated significantly with Supervisor Rating (r=.50, p<.01). For the 27 subjects, together The Piers-Harris Children's Self-Concept Scale, The Matching Familiar Figures, and The Picture Motivation Scale accounted for 57 percent of the variance in Supervisor Ratings (R= .76, p<.025). For the subset of the 27 subjects, individuals who had lower reported self-concepts about their academic and intellectual ability were rated higher by their supervisors and were producing at a higher rate. Those who gave higher reports of their ability were rated lower and produced at a lower rate. The supervisors may have given higher ratings to those vocational trainees who showed more realistic assessment of their abilities. Furthermore, production rates may have been higher for vocational trainees with more accurate self-concepts. The results of this study replicate Ringness' (1961) findings. This study seemed to indicate either an unrealistically high self-concept in mentally retarded poor achievers and/or a problem with reliability of measures of self-concept in mentally retarded subjects. The study also illustrates the very large individual differences regarding personality and motivational variables existing in the group of vocational trainees.

Zigler and his colleagues (Glick & Zigler, 1985) have developed a developmental theory of self-concept (see the section on the rigidity hypothesis) which has been applied successfully to persons with mental retardation (Leahy et al., 1982; Zigler et al., 1972) and may give self-concept research new vigor and thrust.

4. Anxiety Theories have also long dominated mainstream psychological research (Cantor, 1963; Covington, 1987; Hill, 1984; Hill & Wigfield, 1984; Sarason, Davidson, Lighthall, Waite, & Ruebusch, 1960; Spielberger, 1972) but have not been fruitfully applied in allowing us to understand the motivational systems operating in mentally retarded persons perhaps because of the same reasons which have hampered the application of self-concept theories to persons with mental retardation (limited verbal ability of the mentally retarded group, and the lack of suitable research instruments having adequate reliability and construct validity in mentally retarded populations). Balla and Zigler (1979) believe that there are suitable instruments, The Children's Manifest Anxiety Scale (CMAS) (Castaneda et al., 1956) even though it requires a fourth grade reading level, as well as The Test Anxiety Scale for Children (TASC) (Sarason et al., 1960) which can be applied to persons who are mentally retarded.

It might be expected that mentally retarded persons because of their history of failure, social deprivation, and cognitive deficiencies may have higher levels of anxiety regarding their ability to cope with their life experiences compared to nonretarded persons, and that these levels of higher anxiety may depress even more their competence to solve problems in school, at work, and in the community. These expectation have for the most part been supported.

Lipman (1960) compared the CMAS scores of institutionalized mildly mentally retarded females to their nonretarded mental age matches and found evidence of higher levels of anxiety in the mentally retarded group. Lipman and Griffith (1960) attempted to determine the relationship between CMAS scores and a test of verbal abstraction in a group of institutionalized mildly mentally retarded persons. There was a moderate negative correlation between CMAS scores and verbal abstracting performance, and a strong positive correlation between psychometric intelligence and the total abstracting score. Anxiety depressed performance on the hard items but did not facilitate performance on the easy items, a kind of Yerkes-Dodson Law (Yerkes & Dodson, 1908). Cochran and Cleland (1963) found greater

levels of anxiety in an institutionalized retarded sample than in either a CA or academically matched sample of nonretarded persons. Generally, persons with mental retardation have higher levels of anxiety than their MA and CA nonretarded match, with institutionalized retarded samples being more anxious than retarded samples living in the community (Balla & Zigler, 1979).

5. Effectance Motivation And Intrinsic Motivation Theories have greatly influenced our understanding of exploration, curiosity, mastery, and play behavior in both persons who are mentally retarded and in nonretarded persons (Harter & Zigler, 1974; Haywood, 1992; Haywood & Switzky, 1986, 1992; Switzky & Haywood, 1974, 1984, 1991, 1992; Switzky & Heal, 1990; Switzky et al., 1974, 1979; Zigler & Balla, 1982; Zigler & Hodapp, 1991). In the writer's opinion. this area of research has been one of the most fruitful and productive areas of experimentation in aiding us to understand personality and motivational processes in persons with mental retardation. Much of this work in the field of mental retardation has been done by two research groups: the Yale Group, and the Peabody-Vanderbilt Group. Both Groups were deeply influenced by White's (1959) formulation of effectance motivation or mastery motivation which theorized that every one has an intrinsic need to feel competent in their world which is associated with the pleasure and sustained performance individuals' derive from using their own cognitive resources for their own sake and being independent from environmentally derived external reinforcement, especially in the domains, of exploration, play, curiosity, and mastery of the environment.

The Yale Group has conceptualized the motivational problems of persons with mental retardation as due in part to deficient effectance motivation and lack of concern for the intrinsic motivation that inheres in being correct regardless of whether or not an external agent dispenses the reinforcer for such correctness. This lack of effectance motivation is characterized by being heavily dependent on receiving environmentally derived external reinforcement feedback in order to perform a task (i.e., (task) extrinsic motivation) and an overreliance on clues from the external environment to help guide behavioral performance (i.e., outerdirectedness) with a concomitant increase in extrinsically motivated behavior. Generally persons with mild mental retardation because of their socially depriving life histories, their greater cognitive deficiencies, and related failure experiences, compared to

nonretarded persons of the same mental age have less effectance motivation and more of an extrinsic motivational orientation leading to different patterns of incentives and reinforcement hierarchies compared to nonretarded persons (Balla & Zigler, 1979; Hodapp et al., 1990, Merighi, et al., 1990; Zigler & Balla, 1981, 1982; Zigler & Hodapp, 1991). Harter and Zigler (1974) constructed measures of several aspects of effectance motivation: variation seeking, curiosity, mastery for the sake of competence, and preference for challenging tasks. Intellectually average children, noninstitutionalized retarded children living at home, and institutionalized retarded children, all matched on mental age were evaluated. On all measures of effectance motivation, the intellectually average children showed the greatest desire to master a problem for the sake of mastery, to choose the most challenging task, and showed the greatest curiosity and exploratory behavior (more effectance motivation) than did the retarded children. The institutionalized retarded children showed the least effectance motivation, and the retarded children living at home showed intermediate amounts of effectance motivation. The nonretarded children choose a nontangible symbolic reward (a "good player" certificate) over a tangible reward (candy) more often than both groups of retard children. Individuals who are mentally retarded appear to be less characterized by intrinsic effectance motives and preference for nontangible symbolic reinforcers than are nonretarded individuals. Institutionalized retarded persons appear to be the least motivated by effectance motives, even less so than their retarded mental age matched peers living at home.

Harter and her colleagues (Harter, 1978; Harter, 1981a, 1981b, 1982, 1983, 1987; Harter & Connell, 1984; Harter & Pike, 1984; Renick & Harter, 1989; Silon & Harter, 1985) have recently developed a program of developmental research in which White's (1959) theories of effectance and mastery motivation have been refined, extended, and operationalized.

Harter (1978, 1983) has presented a general model of effectance motivation that could have implications for the development of extrinsic and intrinsic motivational orientations in persons with mental retardation. According to her basic model, the developmental pathways that lead to an intrinsic orientation are associated with positive reinforcement or approval by socialization agents for independent mastery attempts early in children's development. Additionally, socialization agents may

model this approval and not reinforce children for dependency on adults. As a result, children internalize two critical self-systems: (a) a self-reward system, and (b) a system of standards or mastery goals that diminishes the children's dependency on external extrinsic social reinforcement. This leads to feelings of competence and feelings of being in control of one's successes and failures and increases children's effectance motivation and intrinsic motivation. This increased sense of intrinsic pleasure enhances one's motivation to engage in subsequent mastery behavior. Thus, children's social environments support their inherent need for mastery over their worlds with the result that their behavior and incentive systems may be characterized as intrinsically motivated.

The developmental pathways that lead to an extrinsic orientation consist of negative outcomes such as lack of reward for or disapproval of independent mastery attempts, modeling of such disapproval, as well as reinforcement for dependency by adults. Children in these environments increasingly manifest strong needs for external approval and dependence on externally defined behavioral goals. This leads to feelings of low perceived competence and perceptions that external agents and events are controlling what is happening. These feelings of not being in control of one's successes and failures lead to feelings of anxiety in mastery situations and attenuate the motivation to be engaged in mastery behavior. Thus, such a child's effectance motivation is blocked and reduced, resulting in an extrinsic motivational orientation. Children who have experienced early failure and disapproval by socialization agents become children whose behavior is extrinsically motivated. This latter pattern may be especially characteristic of retarded and behaviorally incompetent children (e.g., those who are behaviorally disordered, learning disabled, or have motoric, or sensory handicaps), leading them to display ever greater behavioral deficits than would have been predicted on the basis of their initial incompetence: i.e., the MA deficit. This analysis is very similar to models derived and extended from the Peabody-Vanderbilt Group (Haywood, 1992; Haywood & Burke, 1977; Haywood & Switzky, 1986, 1992; Haywood et al., 1982; Schultz & Switzky, 1990, 1993; Switzky & Haywood, 1984, 1991; Switzky & Heal, 1990; Switzky & Schultz, 1988), as well as models derived and extended from the Yale Group (Hodapp et al., 1990; Weisz, 1979, 1981, 1990).

Weisz (1990) has shown that psychosocially retarded children, because of their lifetime exposure to failure experiences, appear to be more susceptible to learned helplessness (i.e., a learned perception that one cannot control outcomes, Abramson, Seligman, & Teasdale, 1978) than are nonretarded children. Psychosocially mentally retarded children may show extreme performance deterioration in problem-solving ability in response to failure feedback. Psychosocially mentally retarded children may have high expectancy of failure; when confronted with failure experiences, they may just stop performing.

Harter has developed several self-report instruments to measure components of her model of effectance motivation. The Scale of Intrinsic Versus Extrinsic Orientation in the Classroom (Harter, 1981b) is intended to measure motivational orientation in the classroom in nonretarded children in grades 2-9. Factor analysis resulted in two factors: (a) a motivational factor labelled curiosity/interest, and (b) a cognitive-informational factor labelled independent judgement versus reliance on teacher's judgement. Different developmental trends were shown for the motivational factor and the cognitive-informational factor. On the motivational factor, children began with high intrinsic scores in the third grade which shifted to high extrinsic scores by grade nine. This shift toward increasing extrinsic orientation is difficult to interpret. It might reflect an adaptive reaction of students to the teaching styles and school socialization climate created by teachers in the school who use extrinsic reinforcers and performance feed-back in a "controlling" fashion rather than in an "informational" manner thereby supporting an extrinsic orientation learning style in the students. The "informational classroom" environment conveys relevant information to the student about the student's competence at a task, thus supporting self-autonomy and intrinsic motivation in the learner. The "controlling" classroom environment is designed to bring about a particular behavioral outcome in the student, thus supporting dependency and extrinsic motivation in the learner (Connell & Ryan, 1984; deCharms, 1968, 1976, 1984; Deci & Ryan, 1985; Deci, Nezlek, & Scheinman, 1981; Deci, Schwartz, Scheinman, & Ryan, 1981; Ryan, Connell & Deci, 1985; Ryan, Connell, & Deci, 1989 ; Schultz, & Switzky, 1990; Switzky, & Schultz, 1988).

On the cognitive-informational factor, an opposite linear trend was observed. Third grade children had high extrinsic scores, representing dependency on the teacher's judgement and external sources of evaluation, whereas ninth grade children had high intrinsic scores representing reliance on their own judgement and self-evaluation of success and failure. These trends may represent the internalization of the mastery goals of the classroom as well as its performance criteria, and the children's increasing knowledge of the rules of the school.

Harter (in press) has modified her scales to include a subscale to assess internalized motivation. The questionnaire contains 24 items to assess three motivational orientations (extrinsic, intrinsic, internalized), The students are asked to rate the truth value of a series of statements that reflect different goals and reasons for performing one's school work. An item assessing internalized motivation ("I do my schoolwork because I've learned for myself that it's important for me to do it") can be contrasted with an intrinsic reason ("I do my schoolwork because what we learn is really interesting") and an extrinsic reason ("I do my schoolwork because my teacher will be pleased with me if I do it").

Abhalter and Switzky (1992) using Harter's Scale of Intrinsic Versus Extrinsic Orientation in the Classroom on a population of upper middle class children in the second through fifth grade only partially replicated Harter's (1981b) findings. On the motivational factor (curiosity/interest) children began with high intrinsic scores which sharply increased with grade level, i.e., there was an increasing intrinsic orientation. On the cognitive-informational factor, a similar trend was observed, intrinsic scores increased with grade level. The Abhalter and Switzky (1992) finding supports the importance of the school climate variables operating. In the particular school system studied it was observed that classroom teachers tended to function in more of an "informational" than in a "controlling" manner.

Silon and Harter (1985) have used the Scale of Intrinsic Versus Extrinsic Orientation in the Classroom with a sample of 9-to-12 year old mildly mentally retarded children. Factor analysis resulted in two factors similar to those found in the sample of nonretarded children: (a) a motivational factor labelled motivation for hard work, and (b) a cognitive/informational factor labelled autonomous judgement. The most salient motivational theme for the sample of retarded children was wanting to do either difficult or easy school work rather than a more global intrinsic or extrinsic orientation. The

retarded children's concern seemed to be more on what one wants to do in the classroom (hard vs easy work) rather than on the reasons why one performs in the classroom (curiosity). Although there are differences in what is being measured by this scale with groups of mentally retarded and nonretarded children, the mentally retarded children appear considerably more extrinsically oriented than do the nonretarded children, replicating the findings of the Peabody-Vanderbilt Group which has been studying intrinsic and extrinsic motivational self-system processes for more than 30 years. The details of their research findings will be discussed later in this section.

Harter (1982b) developed another self-report scale, The Perceived Competence Scale for Children in an attempt to measure domain-specific feelings of competence in nonretarded children in grades 3-9. Four domains of perceived competence were hypothesized: (a) cognitive competence, with an emphasis on academic performance, (b) social competence, with an emphasis on peer relationships, (c) physical competence, with an emphasis on sports and outdoor games, and a (d) general sense of self-worth. Confirmatory factor analysis supported these four domains of competence.

Silon and Harter (1985) used The Perceived Competence Scale for Children on a sample of mildly mentally retarded children ages 9 to 12 years. Factor analysis resulted in two factors similar to those found by Harter and Pike (1984) in nonretarded children ages 4 to 7 years: (a) a factor composed of the cognitive competence and physical competence subscales labelled general competence, and (b) a factor composed of items from the social competence subscale labelled popularity. No general self-worth factor emerged. Mildly mentally retarded children with mental ages less than 8 years appeared not to make distinctions about specific competence domains but rather simply made judgments about one's competence at activities in general, judging people to be competent or not competent, as do young nonretarded children.

Research (Harter & Pike, 1984; Nicholls, 1984, 1990; Nicholls & Miller, 1984a, 1984b) has shown that self perceptions of competence change developmentally. Nonretarded children below the age of 8 years do not make judgments concerning their holistic worth as persons. They have not yet developed the concept of the self as a global entity that can be evaluated in terms of general worth. Preschool children through grade 2 have a broadly defined concept of competence that includes social

behavior, performance, and effort (Blumenfeld, Pintrich, Meece, & Wessels, 1982; Stipek, 1984; Yussen & Kane, 1985). As the children proceed developmentally they increasingly differentiate among their competence domains (Marsh, Barnes, Cairns, & Tidman, 1984; Nicholls, 1989).

The Peabody-Vanderbilt Group has for more than 30 years studied the operation of intrinsic motivation as the primary concept in a cognitive theory of motivational orientation (Haywood, 1992; Haywood & Burke, 1977; Haywood & Switzky, 1986, 1992; Schultz & Switzky, 1990; Switzky & Haywood, 1974, 1984, 1991, 1992; Switzky & Schultz, 1988; Switzky et al., 1974, 1979) in which the central idea is behavior for its own sake and its own reward and in the view that using one's cognitive resources to the fullest is intrinsically gratifying and motivating. The Peabody-Vanderbilt Group has investigated individual differences, both in mildly handicapped and in non-handicapped persons, in task-intrinsic and task-extrinsic motivation, and how these differences affect behavior under specified conditions.

The theory of motivational orientation and its key concept of "intrinsic motivation" is related to White's (1959) theory of effectance motivation, but was more directly influenced by Hunt's (1963, 1965, 1966, 1971) conception of "motivation inherent in information processing and action", the two-factor theory of work motivation formulated by Herzberg (Herzberg, 1966; Herzberg & Hamlin, 1961, 1963; Herzberg, Mausner, & Snyderman, 1959), and later by Bandura's social cognitive learning theories, especially his formulation of the self-system in reciprocal determinism (Bandura, 1977, 1978, 1986a), and Feuerstein's theory of mediational learning experiences (MLE) (Feuerstein & Rand, 1974, Feuerstein, Rand, Hoffman, & Miller, 1980; Feuerstein, Klein, & Tannenbaum, 1991).

The term "intrinsic motivation" is used in somewhat different but overlapping ways as the theory of motivational orientation developed. Using Hunt's system. intrinsic motivation refers to what Hunt (1963, 1971) has called "motivation inherent in information processing and action". In this sense it is behavior in the absence of external stimulation or the possibility of external consequences, arising from the expectation of the joy of the information-processing activity itself. According to this view, individuals explore for the satisfaction of taking in and processing new information, even though encountering new information may result in an increase rather than a decrease in the total level of tension within one's

psychological system (Haywood & Burke, 1977; Haywood & Switzky, 1992; Hunt, 1965, 1966, 1971). Hunt (1963) proposed eight questions that a theory of motivation must answer:

1. The instigation question is concerned with what initiates behavior and what terminates behavior?

2. The energization question is concerned with what controls the vigor of an activity?

3. The direction-hedonic question is concerned with what controls the direction of behavior? What selects the cognitive activities individuals perform from among an array of available options?

4. The cathexis question is concerned with the choice of objects, places, and persons, individuals may form attachments with?

5. The choice of response question is concerned with what control the particular response individuals finally make from among an array of responses?

6. The choice of goals question is concerned with what controls the particular end-goal individuals finally make from among an array of goals?

7. The learning question is concerned with identifying the factors that underlie and influence behavioral, conceptual change, and performance for individuals?

8. The persistence question is concerned with why individuals persist in utilizing responses that fail to achieve their goals and why they persist in seeking goals they do not achieve?

In terms of Hunt's motivational questions (Haywood, 1992), intrinsic motivation instigates activity, especially mental activity, because activity is more pleasant and more exciting than inactivity. It leads to more vigorous behavior than does task-extrinsic motivation thus energizing behavior. It directs behavior toward the more psychologically exciting or interesting of alternative paths. Intrinsic motivation aids in the formation of unique attachments/cathexes specifically leading individuals to return to intrinsically motivating tasks. Choice, both of response and of goal, may constitute the most powerful function of intrinsic motivation. Given an array of choices, intrinsically motivated individuals will select responses that are more difficult to perform, and will move individuals toward distant goals compared to extrinsically motivated persons. Intrinsic motivation will increase learning efficiency and the persistence of performance for individuals in using responses that fail to achieve their goals, and in pursuing goals

that are not achieved, simply because it is the activity itself that is rewarding, and not the mere attainment of goals that is motivating.

A second use of the term intrinsic motivation (Haywood & Switzky, 1986) is embodied in the term " task extrinsic versus task extrinsic motivation which is viewed as a learned personality trait by which individuals may be characterized in terms of the location of incentives that are effective in motivating their behavior rather than in the context in which tasks are performed. Individuals may be motivated by task-intrinsic factors (e.g., responsibility, challenge, creativity, opportunities to learn, and task achievement) or by task-extrinsic factors (ease, comfort, safety, security, health, and practicality aspects of the environment). Individuals who are motivated by task-intrinsic factors are referred to as intrinsically motivated (IM), whereas, individuals who are motivated by task-extrinsic factors are referred to as extrinsically motivated (EM). While all persons respond to each kind of incentive, it is the relative balance between the two sources of motivation, i.e., the relative number of situations in which one is likely to be motivated by task-intrinsic versus task-extrinsic factors, that constitutes a stable and measurable personality trait. This aspect of the theory of motivational orientation was derived from the two-factor theory of work motivation formulated by Herzberg (Herzberg, 1966; Herzberg et al., 1959).

Herzberg et al. (1959) looking for sources of job satisfaction and dissatisfaction in industrial workers, asked workers to think of times when they had been quite satisfied with their jobs and times when they had been so dissatisfied that they had thoughts of changing jobs, and then to identify the variables to which they attributed their dissatisfaction or satisfaction. In characterizing periods of dissatisfaction the workers listed such variables as low pay, poor, unhealthy, hazardous or uncomfortable work conditions. The context in which the job was performed, and lack of security, all conditions extrinsic to the job (to the task), it self, i.e., task-extrinsic motivation. In characterizing periods of positive job satisfaction, instead of referring to the opposite poles of the dissatisfying task-extrinsic conditions the workers listed such task-intrinsic variables as the sheer psychological satisfaction of doing a task, opportunities to learn new things, opportunities to exercise creativity, take responsibility or experience aesthetic aspects of the job (the task), all conditions intrinsic to the job (to the task) itself, i.e., task-intrinsic motivation. Herzberg conceived of these variables not as lying on a single bipolar

dimension but as constituting two nonoverlaping dimensions that could vary simultaneously. Subsequent research revealed the power of the "motivator" (i.e., task-intrinsic factors in the theory of motivational orientation) variables over the "hygiene" (i.e., task-extrinsic factors in the theory of motivational orientation) in improving job satisfaction and job performance in a variety of industrial settings. A significant relationship to mental health was demonstrated by Herzberg and Hamlin (1961, 1963) who showed that intrinsic motivation appeared to be positively correlated with mental health and negatively correlated with mental illness.

Haywood and his colleagues in the Peabody-Vanderbilt Group (Haywood, 1992; Haywood & Burke, 1977; Haywood & Switzky, 1986, 1992; Haywood, Tzuriel & Vaught, 1992; Switzky & Haywood, 1984; Tzuriel, 1991) believe that the processes of thinking, learning, and problem-solving develop transactionally with task-intrinsic motivation, and related attitudes about learning and thinking, self-concept variables, and habits of working, thinking, and learning. They suggest that there is a transactional relationship among fluid intelligence, cognitive development, and the development of motivational orientation. (See Borkowski et al., 1990, 1992 for a related theory concerning the relationship among cognitive development, motivation, and problem-solving behavior). The Peabody-Vanderbilt Group suggest that all children, regardless of their level of fluid intelligence, are born with a general motive to explore and gain mastery over their worlds, i.e., with both curiosity and competence motives (Switzky, et al., 1974, 1979). What happens to these motives is a direct function of the consequences both direct and social, of their successive attempts to explore and to gain mastery. Beginning with the Pavlovian orienting reflex, children's exploratory/mastery behaviors are supported with relative success or failure experiences, and these consequences constitute reinforcing conditions that lead to acceleration or deceleration of these behaviors. Parents' responses to the exploratory/mastery behaviors of their childrens' performance provide feed-back regarding the success or failure of the outcomes. Exploratory behaviors of relatively incompetent children (e.g., mentally retarded, learning disabled, behaviorally disordered, motoric or sensory-impaired), meeting often with failure, become increasingly less frequent, resulting in less inclination of these relatively incompetent children: (a) to expose themselves to novel stimuli, (b) to derive less information from their (less and

less frequent and less and less intense) encounters with their environments, and (c) to accumulate less basic knowledge about their worlds to evaluate, to understand, and to elaborate subsequent new information to induce generalizations about the rules and structures of their worlds. The deficient cognitive development of these children is directed toward the development of the personality-trait of task-extrinsic motivation, i.e., the tendency to attend to nontask and therefore non-failure producing aspects of the environment in order to avoid dissatisfaction and failure rather than to seek satisfaction and success. In contrast, relatively competent children engage similarly in initial attempts to explore and gain mastery, however, these attempts are met by successful feedback by parents and other socializing agents thereby strengthening exploratory and curiosity behaviors, resulting in more inclination of these relatively competent children: (a) to expose themselves to novel stimuli, (b) to derive more and more information from their encounters with their environments, (c) to accumulate more basic knowledge about their worlds in order to understand, and to elaborate subsequent new information to induce generalizations about the rules and structures of their worlds, and (d) to develop the personality-trait of task-intrinsic motivation, i.e., the tendency to seek success and satisfaction by attending to task-intrinsic aspects of the environment such as, creativity, increased responsibility, new learning, psychological excitement, and task-intrinsic aesthetics. This personality trait of task-intrinsic motivation is later expressed as a greater frequency of choices of activities in response to task-intrinsic incentives than in response to task-extrinsic incentives. One the other hand, the personality trait of task-extrinsic motivation is later expressed as a greater frequency of choices of activities in response to task-extrinsic incentives than in response to task-intrinsic incentives. The cognitive and motivational aspects of individuals thus develop in a transactional way: (a) for less competent individuals (e.g., mentally retarded, learning disabled, behaviorally disordered, motoric or sensory impaired), lack of external and social feedback of successful exploratory behavior by parents and other socializing agents results in less attempts at exploration and knowledge acquisition and the creation of an extrinsic-motivational orientation which creates the conditions of even less exploration and knowledge acquisition and a further slowing of cognitive development and an increasing extrinsic-motivational orientation (the "poorer get poorer" phenomenon, Haywood, 1992; Haywood & Switzky, 1992; Haywood et al., 1992,

which is related to the earlier concept of the "MA deficit", Haywood & Switzky, 1986; Haywood et al., 1982, ie., the phenomenon that even if retarded persons are matched on mental age with nonretarded younger persons, the retarded persons do less well on a variety of measures of learning and behavioral effectiveness, Lipman, 1963; Stevenson & Zigler, 1958; Zigler, 1973), (b) for more competent individuals, the presence of external and social feedback of successful exploratory behavior by parents and other socializing agents results in accelerating increasing attempts at exploration and knowledge acquisition and the creation of an intrinsic-motivational orientation which creates the conditions of even more exploration and knowledge acquisition and an increasing intrinsic-motivational orientation (the "richer get richer" phenomenon, Haywood, 1992; Haywood & Switzky, 1992; Haywood et al., 1992).

The primary instrument used by the Peabody-Vanderbilt Group to measure motivational orientation in mentally retarded as well as nonretarded persons was the Picture Choice Motivation Scale (Kunca & Haywood, 1969). In this scale, each item is a pair of pictures of people engaged in different activities, vocations, or endeavors determined to be qualitatively either extrinsic (EM) or intrinsic (IM). For each of the 20 pictures illustrating an intrinsically (e.g., opportunity to learn, challenge, intense psychological satisfaction, responsibility) or an extrinsically (e.g., opportunity for safety, ease, comfort, security) motivated activity, the individual is asked which one would be preferred. The final score used to classify the individual is the number of IM choices out of the 20 pairs. The Picture Motivation Scale is useful with persons from a mental age of 3 years up to adolescence and has yielded reliability coefficients generally in the 0.80-0.90 range (Kunca & Haywood, 1969; Miller, Haywood & Gimon, 1975; Switzky & Haywood, 1992). Several studies have shown that the picture scale yields a roughly normal distribution of scores down to about the mental age of 3 years and that this distribution tends to become skewed (i.e., higher frequencies of intrinsic responses) with increasing chronological and mental age, and psychometric intelligence up to middle adolescence (Call, 1968; Haywood, 1968a, 1968b; Haywood & Switzky, 1986; Switzky & Haywood, 1992). Generally, having an intrinsically-motivated orientation is an increasing function of chronological age, mental age, psychometric intelligence, and social class. Usually mentally retarded persons as a group are more extrinsically motivated (EM) compared with nonretarded persons of similar age. However, some

mentally persons are found to be intrinsically-motivated (IM). (See Switzky & Heal, 1990, for an extensive discussion of the construct validity of The Picture Motivation Scale).

The theory of motivational orientation would predict:

1. That having an IM orientation is helpful to both mentally retarded and nonretarded learners compared to having an EM orientation in terms of learning more effectively. However, having an IM orientation may have more impact on mentally retarded learners. Generally, these predictions have been confirmed. IM learners work harder and longer on a task compared to EM learners (Dobbs, 1967; Haywood, 1968a, 1968b; Haywood & Switzky, 1986; Haywood & Wachs, 1966; Schultz & Switzky, 1993; Wooldridge, 1966).

2. That there is an interaction between motivational orientation and incentives, such that one must match incentive systems to the unique motivational orientations of individuals, i.e., the performance of IM individuals will be optimally reinforced by task-intrinsic incentives, whereas the performance of EM individuals will be optimally reinforced by task-extrinsic incentives. Generally these predictions have been strongly confirmed (Gambro & Switzky, 1988, 1991; Haywood & Switzky, 1975, 1985, 1986, 1992; Haywood & Weaver, 1967; Haywood, Tzuriel, & Vaught, 1992; Schultz & Switzky, 1990, 1993; Switzky, 1985; Switzky & Haywood, 1974, 1984, 1991, 1992; Switzky & Heal, 1990; Switzky & Schultz, 1988).

1. IM Learners Learn More Effectively.

IM learners may be characterized as "overachievers" and EM learners as "underachievers" on tests of school achievement, the efforts intensifying as the intelligence levels of the students decrease. In a set of studies (Haywood 1968a, 1968b; Switzky & Heal, 1990) relating motivational orientation to academic achievement levels on the reading, arithmetic, and spelling subtests on the Metropolitan Achievement Test for a sample of 10-year old students across three levels of intelligence (educable mentally retarded, IQs 65-80), (intellectually average, IQs 95-109), (intellectually superior, IQs, 120 and above) it was found:

(a). Overachievers were found to be relatively more IM and underachievers relatively more EM in all three academic areas. Overachievers tended to be motivated to a greater extent by factors

inherent in the performance of academic tasks, while underachievers tended to be motivated more by factors extrinsic to the task itself.

(b). The difference in motivational orientation between overachievers and underachievers were largest for the group of educable mentally retarded students (EMR) and smallest for the group of intellectually superior students. The effects of motivational orientation intensified as the intellectual ability levels of the students decreased so that a disproportionate number of lower ability students were assessed to be extrinsically motivated.

(c). When the groups of students were matched on age, sex, and IQ, it was found that in all three achievement areas, IM students were achieving at a higher level than EM students. However, the effects varied with level of intelligence. Individual differences in motivational orientation were associated with 0% of the variance (using eta-squared) in achievement scores of the intellectually superior students, but such differences were associated with 10% of the variance (using eta-squared) of the intellectually average students, and up to 30% of the variance using (eta-squared) of the EMR students. On the average, the IM students in the average-IQ and EMR groups had achievement test scores about one full school year higher than those of the EM students in the same IQ group. The achievement of the IM EMR students were not different from that of the EM average-IQ students. Thus, there was compelling evidence (1) that intrinsic motivation is associated with higher school achievement, and (2) that the effects of the individual differences in motivational orientation appeared to be greater as IQ declined. While these students, were not given the test of intrinsic motivation until they were 10-years-old, retrospective examination of their school achievement scores showed that the achievement differences were all ready present in the first grade. Thus having more of a relatively IM orientation can compensate by increasing performance levels in students of lower intelligence. Having more of a relatively EM motivation will decrease performance in students even below that predicted by their MA levels.

Schultz and Switzky (1993) examined how intrinsic motivation affected reading comprehension and mathematics achievement on the Basic Achievement Skills Individual Screener (BASIS) (Sonnenschein, 1983) in a group of urban minority elementary and junior high school students in the

second through seventh grade (mean age = 11.4 years) with Behavior Disorders (BD) as compared to their nonhandicapped peers. The purpose of the study was to demonstrate how differences in motivational orientation (IM vs EM) contributed to the academic performance deficits often observed in children with behavior problems by using a design analogous to the one used by Haywood (1968a, 1968b) where groups of students were matched on age, sex, and IQ, thereby potentiating the effects of motivational orientation on academic achievement. Previous studies (Schultz & Switzky, 1990, Switzky & Heal, 1990; Switzky & Schultz, 1988) suggested that the lower than expected school achievement in students with BD may result from an EM orientation to academic activities. Additionally, possessing an EM orientation may further intensify existing problems in achievement due to students' sub-average intelligence and emotional problems. Having more of an IM orientation to academic activities may compensate for students' sub-average intelligence and emotional problems and raise levels of school achievement. The expectation was that IM BD students would demonstrate higher levels of scholastic achievement than EM BD students. A 2 (BD or Nonhandicapped group) X 2 (IM or EM Motivational orientation) multivariate analysis of covariance (MANCOVA) with IQ, Age, and Sex as covariates was used with reading comprehension and mathematics achievement as dependent measures. The results showed a main effect for Group indicating both higher mathematics and reading achievement for the nonhandicapped students compared to the students with behavior disorders. There also was a main effect for Motivational Orientation indicating that IM students had higher reading comprehension than did EM students. More importantly there was an interaction between Group and Motivational Orientation indicating that BD students exhibited significantly greater academic performance differences due to motivational orientation compared to their nonhandicapped peers. IM BD students have both higher mathematics and reading achievement than do EM BD students, whereas there is no difference between the IM and EM nonhandicapped students'mathematics and reading achievement. Individual differences in motivational orientation appear to effect the academic performance of BD students to a greater extent compared to their nonhandicapped peers. These achievement differences reveal that children in both groups who are more motivated by factors intrinsic to learning tend to achieve at a higher level than children who are motivated by extrinsic factors. While these academic performance

differences due to motivation orientation appear to be significant in both groups of children, they are much more important in students formally identified as behavior disordered. IM BD students had substantially higher math and reading achievement test scores than did EM BD students. The results of this study support previous research (Haywood 1968a, Haywood, 1968b; Haywood & Switzky, 1986; Switzky & Heal, 1990) which suggests that the lower than expected school achievement observed in many exceptional students (MR or BD) is associated with having an extrinsically motivated orientation to academic activities which may further intensify existing problems in achievement due to the students' sub-average intelligence and emotional problems. Having more of an intrinsically motivated orientation to academic activities may compensate for many exceptional students' sub-average intelligence and emotional problems and raise levels of school achievement.

2. There Is An Interaction Between Motivational Orientation And Incentives.

There is an interaction between motivational orientation and incentives, such that one must match incentive systems to the unique motivational orientations of individuals, i.e., the performance of IM individuals will be optimally reinforced by task-intrinsic incentives, whereas the performance of EM individuals will be optimally reinforced by task-extrinsic incentives. This original formulation of theory was first tested by Haywood and Weaver (1967) and then expanded by a whole series of studies (Gambro & Switzky, 1988, 1991; Haywood & Switzky, 1975, 1985, 1986, 1992; Haywood, Tzuriel, & Vaught, 1992; Schultz & Switzky, 1990, 1993; Switzky, 1985; Switzky & Haywood, 1974, 1984, 1991, 1992; Switzky & Heal, 1990; Switzky & Schultz, 1988) which were interpreted in terms of Bandura's (1969, 1976, 1978, 1986a) social cognitive learning theories, especially his theory of self-reinforcement, and his formulation of the self-system in reciprocal determinism which stressed the importance of self-system processes reciprocally interacting with the external demand characteristics of the environment, and the individual's own behavior:

> In the social cognitive view people are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocality in which behavior, cognitive and other

> personal factors, and environmental events all operate as interacting determinants of each other (Bandura, 1986a, p. 18).

Haywood and Weaver (1967) showed that there was an interaction between the motivational orientation of institutionalized retarded children and adults and the incentives that are effective in a simple task. Relatively IM and strongly EM retarded persons participated in a repetitive motor task under one of four incentive conditions: a 10-cent reward (strong EM incentive), a 1-cent reward (weak EM reward), the promise of an opportunity to do another task (strong IM reward), and no reward (control). EM subjects performed most vigorously under the 10-cent condition and least well under the task-incentive condition, while IM subjects showed the opposite behavior, giving their best performance when offered only the opportunity to do another task and performing least well under the 10-cent incentive condition. In the control condition, IM subjects performed more vigorously than did EM subjects.

In a theoretically important study for the writer done as a post-doctoral fellow mentored under Carl Haywood, which sensitized the author to the importance of self-systems processes in fully understanding the operation of motivational orientation in retarded and nonretarded persons, Haywood & Switzky (1975) presented evidence that the behavior of IM and EM school-age children may be interpreted in terms of Bandura's (1969) concept of self-reinforcement. They found that it was possible to condition the verbal expression of motivation in IM and EM school-age children by contingent social reinforcement of statements that were counter to or supportive of the individual's own motivational orientation. Subjects in all contingent-reinforcement groups learned to discriminate IM from EM statements, with EM subjects demonstrating slightly more efficient learning, suggesting that the task-extrinsic verbal social reinforcement was more effective for them than for the IM children. In a noncontingent (control) condition, where responses were randomly reinforced, IM subjects increased their rate of IM verbalizations in spite of the lack of consistent external verbal social reinforcement, whereas EM subjects failed to show any significant change over trial blocks. The question was what was the source of the reinforcement for the IM subjects in the noncontingent (control) condition that increased their performance? It was self-reinforcement. As Bandura's (1969) concept of self-reinforcement suggested, IM persons may be characterized by self-monitored reinforcement systems

that make them less dependent on external reinforcement conditions, while EM persons may be characterized by dependence on external reinforcement systems. Thus EM children should be differentially more responsive than are IM children to social reinforcement and consequently should show more efficient learning under such task-extrinsic incentives. When task-extrinsic incentives are presented noncontingently, EM children should not show any change in performance, while IM children (who are more sensitive to task-intrinsic incentives and who are more likely to self-reinforce their own behavior) should show changes in performance in spite of the absence of contingent conditions. Thus it is necessary to consider both the nature of the reinforcers and individual differences in motivational orientation, as well as the relative strengths of an individual's self-monitored and externally imposed reinforcement systems, in order to predict performance under different reinforcement operations. This analysis was dramatically confirmed in the next two studies in the series, one with grade school children (Switzky & Haywood, 1974), the other with mildly nentally retarded adults (Haywood & Switzky, 1985).

Switzky & Haywood (1974) showed that in order to predict performance under different reinforcement operations in school children in Grades 2 through 5, it was necessary to consider: (a) the internal or external control of the reinforcers, (b) individual differences in motivational orientation, and (c) the relative strengths of an individual's self-monitored and externally imposed reinforcements. Bandura and Perloff (1967) had compared the motor performance of children under self-monitored and externally imposed reinforcement and found no differences between the two conditions. Both reinforcement conditions sustained responsivity, whereas the control conditions did not. Adding the dimension of individual differences in motivational orientation, Switzky and Haywood (1974) divided their participants into IM and EM samples and gave them the Bandura and Perloff task. Children were given a motor wheel-cranking task in which it was possible to vary the number of cranks of the wheel required to turn on a light on a column of lights, as well as the number of lights that had to be turned on to get a token. Tokens could be exchanged for prizes. In the self-monitored reinforcement condition subjects selected their own schedules, i.e., decided how many cranks were needed to turn on a light and how many lights had to be turned on to earn a token. For each of these subjects there was a

yoked subject in the externally-imposed reinforcement condition who had to follow the schedule selected by the self-monitored subject. They found a dramatic interaction between the reinforcement conditions and the motivational orientations of the participants: IM children worked harder, set leaner schedules of reinforcement, and maintained their performance longer than did EM children under self-monitored reinforcement conditions; by contrast, EM children performed more vigorously and maintained their performance longer under conditions of externally imposed reinforcement. Thus, Bandura and Perloff's (1967) failure to find differential effects of these reinforcement systems may have been due to the cancelling effects of individual differences in motivational orientation, with very strong differential effects interacting with such individual differences. These effects suggest that persons who are predominately intrinsically motivated are characterized by a self-regulatory system such that they are able to determine, choose, and pace their own behavior without direction from or reliance from external environmental sources and if external environmental controlling conditions are imposed, they will interfere with the operation of the intrinsically motivated individuals' self-regulatory system. This latter inference is supported by a set of studies (Deci & Ryan, 1985; Deci et al, 1991; Leeper & Hodell, 1989; Morgan, 1984) showing generally that, for individuals who are already intrinsically motivated, task-extrinsic incentive rewards interfere with task-intrinsic motivation. Conversely, individuals who are predominately extrinsically motivated are primarily under the control of a strongly developed external environmental reinforcement system and need external direction from the environment in order to perform, which makes them less inclined to engage in internally-generated self-regulated activities for their own sake. If forced to determine, choose, and pace their own behavior without direction from or reliance from external environmental sources, such individuals just shut down and perform very poorly under such external-demand conditions.

The Haywood and Switzky (1985) with mildly mentally retarded adults was based on the ideas that (1) self-regulation is extremely important to the ability of retarded persons to adjust to relatively independent living; and (2) the response of retarded persons to expectations of self-regulation or to expectations of external imposiment of regulation depends upon individual differences in task-intrinsic motivation. Since previous studies had shown that retarded persons are, on the average, less

intrinsically motivated than are nonretarded persons, self-regulation might be difficult to produce in retarded persons to the extent that motivational orientation and self-regulatory behavior are related. Additionally, the authors wanted to find out to what extent the incentive-system relationships previously established with normally developing school children were transportable to generally lower levels of intrinsic motivation, specifically those lower levels typically found in retarded persons.

The Haywood and Switzky (1985) experiment was designed as an analogue of the Bandura and Perloff motor task extending the Switzky and Haywood (1974) study to the work behavior of mildly retarded adults. The Haywood and Switzky (1985) study was designed to get evidence on the relative efficacy of self-monitored and externally imposed reinforcement to IM and EM retarded persons, specifically with response to their performance in work-related tasks. It was expected that because IM persons have a more highly developed self-reinforcement system than do EM persons, the IM persons would maintain their performance under conditions of minimal external support. EM persons, on the other hand, were expected to be more responsive to and dependent upon the operation of externally imposed reinforcement. Specifically, it was expected that under conditions in which they set their own performance standards and reinforcement schedules, IM retarded persons would set a higher standard for their performance, maintain their work longer, and set a leaner schedule of reinforcement than would EM persons. By contrast, a condition in which performance standards and reinforcement schedules were imposed externally should be more effective for EM persons than for IM persons in maintaining work. Finally, it was expected that under a no-reinforcement control condition, IM persons would show more sustained work than would EM persons.

The participants were 72 mildly retarded adults residing in a community-based intermediate care facility. The were divided into two groups constituting the top (intrinsically motivated) and the bottom (extrinsically motivated) quartiles of the distribution of intrinsic motivation scores. Their mean age was 40 years (SD=13.52) and their mean IQ was 69 (SD=7.80). Participants were assigned randomly to three conditions: self-regulated reinforcement, externally imposed reinforcement, and no-token control. Participants in the external-reinforcement group were matched individually to participants in the self-regulation group by sex, age, motivational orientation, and in a yoked manner, schedule of

reinforcement. Those in the control group were matched for sex, age, and motivational orientation with participants in the self-regulation group. All participants were given a work task consisting of placing a single flat or lock washer into each compartment of seven 18-compartment boxes placed side by side in a row. Work goals were set by placing a washer in the end-most compartment they intended to reach. Participants in the self-regulation condition set their own work goals, and after reaching the work goals, determined the number of tokens they should get for their work. They also determined how long they would work. Tokens were exchanged for prizes at the end of the experimental session. Selections made by the self-regulation participants were imposed on participants in the external-reinforcement condition. In the control condition, the experimenter set the work goals, participants worked as long as they wished with no indication of "pay" for their work, and were given a prize at the end. The study consisted of a 2 (motivational orientation) X 3 (condition) factorial design. The principal dependent variable was the number of compartments filled (a measure of performance maintenance or task persistence). The analysis of variance revealed a main effect of motivational orientation, $F(1,66) = 13.7$, $p<.01$. IM mentally retarded participants worked harder (mean of 118 compartments filled) than did EM mentally retarded participants (mean of 80 compartments filled), confirming previous research with nonretarded school-aged children (Switzky & Haywood, 1974). In addition there was an interaction of condition and motivational orientation, $F(2,66)=9.97$, $p<.001$, the focus of principal interest in this study. In both the self-regulation and control conditions, IM mentally retarded participants filled more compartments than did EM mentally retarded participants, while IM and EM mentally retarded participants did not differ significantly under the external-reinforcement condition. IM participants also filled more of the compartments under the self-regulation condition than they did under the external-reinforcement condition. A higher level of intrinsic motivation was associated with more self-regulatory behavior than was a lower level of intrinsic motivation, replicating the Switzky and Haywood (1974) findings with nonretarded children and the Haywood and Weaver (1967) findings with mentally retarded adults. These differences in performance between IM and EM persons are due to differences in their internal self-system characteristics. IM persons appear to respond chiefly to internal, cognitive, self-regulatory processes, whereas EM persons appear to respond chiefly to external, environmental

influences. Further, IM persons appear to have a more strongly developed internal reinforcement system, whereas EM person have a more strongly developed external reinforcement system. These ideas were strongly confirmed in the next set of studies which were designed to further test the validity of motivational orientation construct by investigating the effects of internal self-system influences and the role of the external demand characteristics of the environment in mildly retarded adults' (Switzky & Haywood, 1991) and in nonretarded young childrens' (Gambro & Switzky, 1991; Switzky & Haywood, 1992) self-regulatory behavior.

In the Haywood and Switzky (1991) study, the effects of external (environmental) and internal (cognitive) self-influences of self-regulatory behavior were investigated in 60 mildly mentally retarded adults, (one-half were relatively IM and one-half relatively EM; mean age of 37.3 years, SD=11.2; mean IQ of 66.4, SD=14.9), residing in a community-based intermediate care facility. External environmental influences such as stringent, variable, and lenient demand conditions; instructional sets; performance standards; and schedules of self-reinforcement were varied. IM and EM participants were randomly assigned to three conditions of self-reinforcement task demands: stringent (instructed to set very high performance standards, instructed to work as hard and fast as they could on a work task, experimenter modeled a lean schedule of reinforcement), variable (not explicitly instructed as to how hard or fast to work, given choice of high or low performance standards, and experimenter modeled a schedule of reinforcement proportional in richness to the performance criterion chosen, i.e., more tokens for higher goals), or lenient (not explicitly instructed as to how hard or fast to work, but rather allowed to set lower performance standards, experimenter modeled a rich schedule of reinforcement). A motor/attention task was constructed varying in seven levels of difficulty, ranging from 3 to 9 lines of geometric figures arranged randomly on a page. The seven sheets of geometric figures containing random combinations of squares, trapezoids, and heptagons were arranged in sequence from easy (3 lines) to difficult (9 lines) in front of the participants. The performance task consisted of crossing out figures that matched a model (one initially crossed out) on each sheet. All participants were told to perform the task to get tokens that could be exchanged for prizes; the more tokens the better the prize. After reaching their work goals (performance standards) they could pay themselves as many tokens

from a nearby container as they though their work had been worth. The dependent variables were: (1) total work (sum of standards chosen over trials); (2) average performance standard chosen; (3) per cent of modelled standard (goal chosen as a percentage of the goal modelled by the experimenter); (4) schedule of reinforcement (items of work accomplished divided by the number of tokens paid to self); and (5) per cent of modelled schedule of reinforcement (schedule of reinforcement as a percentage of the schedule of reinforcement modelled by the experimenter). The dependent variables were analyzed individually in terms of a 2 (motivational orientation) X 3 (instructional demands) factorial design.

All participants were told to perform the task to get tokens that could be exchanged for prizes; the more tokens the better the prize. After reaching their work goals they could pay themselves as many tokens from a nearby container as they thought their work had been worth. It was expected since internal self-influences interact with external environmental influences in determining behavior, IM mildly retarded persons residing in quasi-institutional settings would perform more vigorously than EM persons under all imposed conditions. This was because IM persons have a more highly developed self-reinforcement system and also as strongly developed an external reinforcement system as do EM persons. IM persons were expected to work harder, set higher performance standards and set leaner schedules of self-reinforcement as compared to EM persons.

Results showed that the differential work performance of persons with mild mental retardation who differ in motivational orientation illustrates that both external-environmental conditions (task demand conditions) and internal-self characteristics (motivational orientation) had significant effects on the performance of the motor/attention task. Participants in the stringent-demand condition worked harder, set higher performance standards (higher goals) and arranged leaner schedules of self-reinforcement than did participants in the lenient demand condition. Intrinsically motivated participants worked harder, set higher performance standards (higher goals) and arranged leaner schedules of self-reinforcement than did extrinsically motivated participants over all demand conditions. Furthermore, intrinsically motivated subjects chose higher performance standards (higher goals) than had been demonstrated to them in the lenient-demand condition and also arranged leaner schedules of self-reinforcement over all demand conditions than had been demonstrated to them, while EM participants

either copied the schedule set by the experimenter or set richer ones. Differences between IM and EM participants were most pronounced in the lenient demand condition, suggesting that individual differences in motivational orientation will lead to the most divergent performances in situations where there is least external support and guidance.

Internal self-system characteristics of mentally retarded persons appear to interact reciprocally with external demand characteristics of the environment to reveal substantial individual differences of self-reward behavior. These effects show that environmental (external) demand instructions do not operate in a vacuum. The recipients play an active role in selecting what information they extract from ongoing events and when and how they use that information and their own abilities. Persons do not simply react mechanically to situational influences; they actively process, interpret, and transfer them in support of Bandura's concept of the self-system in reciprocal determinism (Bandura, 1969, 1976, 1977, 1978, 1986a). The results of this study confirm modern conceptions of the self-system and affirm the role of self-evaluative reactions in the self-regulation of behavior as applied to persons with mild mental retardation, as well as the previous theories and research of the Peabody-Vanderbilt group on the construct validity of motivational orientation (Borkowski et al., 1990, 1992; Deci & Ryan, 1985; Dweck & Leggett, 1988; Haywood, 1992; Haywood & Switzky, 1986, 1992; Haywood et al., 1992; Leeper & Hodell, 1989; McCombs & Marzano, 1990; Nicholls, 1989, 1990; Schultz & Switzky, 1990; Switzky & Heal, 1990; Switzky & Schultz, 1988).

Switzky and Haywood (1992) extended the Switzky and Haywood (1991) paradigm to 32 middle-class nonretarded preschool children one-half of which were relatively intrinsically motivated and the other half were relatively extrinsically motivated (3.1 to 5.8 years, Mean was 4.7 years), in an attempt to investigate further the research validity of the motivational orientation construct by investigating the ontogenesis of intrinsic and extrinsic self-system characteristics and the interaction of ongoing behavior, with stringent and lenient environmental demand conditions in young children's self-reinforcing behavior. The interest was in determining at what age intrinsic and extrinsic motivational self-system characteristics are present and are functional in a population of young children. The effects of a stringent-demand condition, in the form of stringent instructional sets and criterion settings and lean

schedules of self-reinforcement, and a lenient-demand condition in the form of very lenient instructional sets and criterion settings and a very rich schedule of reinforcement were provided to maintain performance on a motor/attention task. A motor/attention task was constructed varying in four levels of difficulty, ranging from 3 to 9 lines of geometric figures arranged randomly on a page (e.g., 3 line, 5 line, 7 line, or 9 line). The work task consisted of crossing out a geometric shape matching one initially crossed out on each sheet. The same dependent variables as in the Switzky and Haywood (1991) study were analyzed individually in terms of a 2 (motivational orientation) X 2 (instructional demands) factorial design. Again, both external and internal self-influences affected self-reinforcement performance on the motor/attention task. Children in the stringent-demand condition set a higher performance standard and arranged a leaner schedule of self-reinforcement than did children in the lenient-demand condition. EM children out performed IM children on measures reflecting the strength of performance (total work behavior and total time working) presumably because of the higher incentive value of the reinforcers for the EM children. In previous research (Haywood & Switzky, 1985; Switzky & Haywood, 1974, 1991), subjects were not shown the reinforcers that were to be exchanged for the tokens until the end of the experiment. In this experiment, reinforcers that were to be obtained by the exchange of the tokens were shown to the children at the very beginning of the experiment, thereby potentiating the incentive value of the reinforcers for the EM children. On measures reflecting internal standards of self-regulation, IM children set a higher performance standard in the lenient-demand condition than did EM children. Also IM children chose a higher performance standard than modeled in the lenient-demand condition than did EM children. This experiment shows that in pre-school age children internal self-regulatory characteristics are present, well organized, and active, which interact with external demand characteristics of the environment to reveal substantial individual differences in the patterns of self-reward behavior.

The purpose of the Gambro & Switzky (1991) study was to further test the research validity of the motivational orientation construct and the ontogenesis of intrinsic and extrinsic motivational self-system characteristics and their interaction with external demand characteristics of the environment in 34 middle-class nonretarded preschool children one-half of which were relatively IM and the other half

were relatively EM (3.7 to 6.0 years, Mean was 4.8 years), by extending the Switzky & Haywood (1992) study in three ways. First, by including two tasks to test the durability of effects. Second, by adding ecological validity through the use of more pragmatic tasks (letter recognition and object sorting) under lenient-demand conditions. Third, by not showing the children the reinforcers that were to be exchanged for the tokens until the end of the experiment thereby not emphasizing the external reinforcers. It was expected since internal self-influences interact with external environmental influences in determining behavior, that IM young children would perform more vigorously under the lenient-demand condition for both tasks. This follows because IM children probably will have a more developed self-reinforcement system than would EM children.

A letter recognition task, was constructed varying in three levels of difficulty, ranging from 3 to 7 lines of upper case letters arranged randomly on a page (3, 5, or 7 lines). The pages were placed side by side in a line. The letter task consisted of crossing out the letters which matched the letter initially crossed out on the first line of each sheet. The sorting task, consisting of 900 blue, brown, and red craft sticks; 650 white and red cotton swaps; and 350 red and green bingo chips, was also constructed ranging in three levels of difficulty. Three piles of materials were placed side by side in a line. The first pile contained 250 blue craft sticks, 250 red craft sticks, and 250 brown craft sticks mixed together randomly. The second pile contained 300 blue craft sticks, 300 red craft sticks, 300 brown craft sticks, 300 red cotton swabs, and 300 white cotton swabs mixed together randomly. The third pile contained 350 blue craft sticks, 350 red craft sticks, 350 brown craft sticks, 350 red cotton swabs, 350 white cotton swabs, 350 red bingo chips, and 350 green bingo chips mixed together randomly. The sorting task consisted of placing all the identical individual items of each category (e.g., blue craft sticks, green bingo chips, red cotton swabs, green craft sticks, etc.) into a corresponding container.

Only one task per day which was counterbalanced over the two days was attempted by each child. For all children, the experimenter explained and demonstrated each task, and then allowed the children two demonstration practice trials. Children were told that they were performing a task for tokens, which could be exchanged for prizes. The more tokens they obtained, the more prizes they

would receive. The reinforcement procedure was modeled by the experimenter. A low work goal was set by the experimenter by instructing the children to work on the easy pile in both tasks.

A 2 (motivational orientation) X 2 (task) factorial analysis was performed with the dependent variable being total time on the two tasks in minutes. The analysis revealed a main effect of motivational orientation. IM children worked longer (Mean=11.4 minutes) than EM children (Mean=8.4 minutes) confirming expectations. The performance of young children with different motivational orientations showed significant individual differences in self-regulatory behavior when completing the two tasks under lenient demand conditions with little emphasis placed on external reinforcers. As expected IM young children spent more time on the tasks when compared to EM young children. IM young children did not rely on external cues, but rather worked until their internal self- standards were satisfied. More EM young children may have worked only until they felt they had earned enough tokens to obtain a prize. In the Switzky & Haywood (1992) study, external reinforcers were stressed, and the EM young children spent more time on tasks. In this study, external reinforcers were de-emphasized, more realistic tasks were utilized, and the lenient-demand condition encouraged young children to use their internal self-system with the result that the EM young children did not work as long because of their dependence on external environmental conditions for guiding their performance.

The Gambro and Switzky (1991) and Switzky and Haywood (1992) studies show that in children younger than 5 years of age, internal self-system characteristics of individuals are present and interact with external demand characteristics of the environment to reveal substantial individual differences in patterns of self-reward behavior, affirming the role of self-evaluative reactions in the self-regulation of behavior in very young children, and extending and confirming the theoretical model of motivational orientation developed by the Peabody-Vanderbilt Group regarding the construct validity of the motivational orientation concept to preprimary children.

Taken together, these five studies (Gambro & Switzky, 1991; Haywood & Switzky, 1885; Switzky & Haywood, 1974, 1991, 1992) suggest that individual differences in motivational orientation are associated with important dimensions of self-regulation, incentive-selection, goal setting, work performance, and perhaps most importantly, the satisfaction derived from the task themselves, both in

mentally retarded and in nonretarded persons ranging from preschool and school-age children, to adults. Bandura's model of the self-system (1969, 1976, 1977, 1978, 1986a), especially his concept of reciprocal determinism, i.e., the continuous reciprocal interaction among the elements of behavior, internal cognitive processes than can affect perceptions and actions, and the external environment, deeply influenced the evolution of the motivational orientation construct of the Peabody-Vanderbilt Group and their research agenda most fruitfully. The research presented here supports Bandura's ideas and confirms related conceptions of the self-system, thus confirming the role of self-evaluative reactions in the self-regulation of behavior in persons with mild mental retardation and in normally developing preschool and school-age children (Borkowski et al., 1990, 1992; Deci & Ryan, 1985; Dweck & Leggett, 1988; Leeper & Hodell, 1989; McCombs & Marzano, 1990; Nicholls, 1989, 1990).

Bandura (1986b) more recently has written about the idea of personal agency, i.e., the idea that individuals take responsibility for their actions and ascribe success and failure to the goals they choose, the resources they mobilize, and the effort they expend. Perceived self-efficacy, ie., beliefs concerning one's capabilities to organize and implement actions necessary to attain designated levels of performance, is one of the most important constructs in Bandura's (1986a) social-cognitive approach and a critical component of personal agency because perceptions of one's ability to behave in a particular way establish one's expectations and motivation. A strong belief in one's ability to use specific actions effectively (high perceived self-efficacy) enhances successful performance, and enhances feelings of pride, satisfaction, and self-respect (Schunk, 1989a, 1989b, 1990). The extension of the study of personal agency and perceived self-efficacy to mentally retarded populations and preschool children may clarify our understanding of the operation of intrinsic and extrinsic motivation within a framework that has been very successful in understanding self-regulation of behavior in older and more normative populations.

The theory of motivational orientation has also been strongly influenced by Feuerstein's theory of mediated learning experiences (MLE) (Arbitman-Smith, Haywood, & Bransford, 1984; Feuerstein & Rand, 1974, Feuerstein, Rand, Hoffman, & Miller, 1980; Feuerstein, Klein, & Tannenbaum, 1991; Haywood, 1977; Haywood & Tzuriel, 1992; Haywood, Brooks, & Burns, 1986). Children acquire

knowledge and understanding in two ways (Schultz & Switzky, 1990): (1) by teaching themselves by learning through natural exposure to environmental stimuli where, because of their inborn intrinsic motivation to learn, they independently acquire very complex skills and abilities, and (2) by learning from significant others in their lives, i.e., acquiring knowledge and understanding from parents and teachers of complex skills that are not easily learned independently. Depending on how they communicate and interact with children when they are passing on knowledge and understanding of skills, teachers and parents play an important role in maintaining and further shaping the natural ability in children to learn intrinsically by creating mediational learning experiences (MLE) which arouse in children vigilance, curiosity, and sensitivity to the mediated stimuli, and create for and with the children temporal, spatial, and cause-effect relationships among stimuli (Schultz & Switzky, 1990; Tzuriel & Haywood, 1992). On the other hand, adult-child instructional interactions which lack this mediational quality tend to undermine the inborn intrinsic motivation that most children bring to the learning experiences they have with adults. Thus, problem-solving behavior reflect the interaction of affective-motivational processes such as motivational orientation (Haywood & Switzky, 1992), and cognitive processes including learned information processing components of intelligence, the internal or mental processes that underlie intelligent behavior: metacognitive and higher order control processes, performance components, and knowledge acquisition components (Borkowski & Kurtz, 1987; Borkowski et al., 1990, 1992; Carr, Borkowski, & Maxwell; Pressley, Borkowski, & Schneider, 1990; Sternberg, 1985), which allow individuals to use their fluid intelligence in an optimal fashion.

In order to qualify as mediated learning experiences (MLE), interaction between children and the mediating adult must meet the following criteria (Feuerstein & Feuerstein, 1991; Haywood et al., 1986):

1. Intentionality. The mediating adult must tend to use the interactions to produce cognitive change in the child.

2. Transcedence. The intended change must be a generalizable one (i.e., a cognitive structural change than transcends the immediate situation and will permit children to apply new processes of thought in new situations).

3. Communication of meaning and purpose. The mediating adult communicates to children the long-range, structural, or developmental meaning and purpose of a shared activity or interaction (i.e., explain why one is doing a particular activity in cognitive terms).

4. Mediation of a feeling of competence. The mediating adult gives "feedback" on the children's performance by praising what is done correctly (i.e., by using correct and/or incorrect aspects of the children's performance and thus attributing the children's achievement to their own efforts and learning strategies).

5. Promote self-regulation of children's behavior. Childrens' behavior is brought under control when they are able to focus attention on the problem or task at hand. Initially, operant controls may be needed to the regulate childrens' behavior; however, these controls need to be removed systematically (and gradually) so that behaviors are maintained with less direct extrinsic reinforcement.

6. Sharing. The children and the mediating adult share the quest for solutions to immediate problems and, more importantly, for the developmental change in the children's cognitive structures. The quest is shared because each has a defined role and function, and the interaction is characterized by mutual trust and confidence.

Of course, the more cognitive abilities, intrinsic motivation, and environmental opportunities children have, the more easily children learn and the greater the proportion they learn naturally and independently, the less the need for repeated and intense mediated learning experiences. Therefore, the need to utilize instructional guidelines that create mediated learning experiences is exacerbated in children with problems that impede their cognitive or motivational development, such as chaotic impoverished environments, mental retardation, learning disabilities, behavior disorders, and sensory and motoric disabilities. Basically (Haywood et al, 1992; Tzuriel, 1991), the affective-motivational factors are thought of as an essential substrate for the proposed relationships among the components of MLE and cognitive modifiability which operate in a transactional fashion, ie., efficient mediation by parents can facilitate affective-motivational processes which in turn, encourage the adult mediators to adjust both the quality and the quantity of their mediation to match their children's responses (e.g. reduce or increase efforts for children's engagement).

Moreover, mediational learning experiences (MLE) need to be used with all children to facilitate their intrinsic motivation and their reliance on internal self-system processes to increase their knowledge acquisition and knowledge usage in order to expand their efficiency to solve problems, and decrease their extrinsic motivation and their overreliance and overdependence on environmental feedback which will decrease their knowledge acquisition and knowledge use and make them less competent and less able to solve problems. Mediational learning experiences have been successfully used for both normally developing, exceptional and high-risk children and adult populations to facilitate learning and intrinsic motivation (Adams, Skuy, & Fridjhon, 1992; Burden, 1987; Egozi, 1991; Kahn, 1992; Kaniel & Tzuriel, 1992; Kaniel, Tzuriel, Feuerstein, Ben-Shachar, & Eitan, 1991; Keane, Tannenbaum, & Krapt, 1991; Klein, 1991, 1992; Kopp-Greenberg, 1991; Lidz, 1991a, 1991b; Mintzker, 1991; Marfo, 1992; Notari, Cole, & Mills, 1992; Savell, Twohig, & Rachford, 1986; Sewell & Price, 1991; Tannenbaum, 1991; Thoman, 1992; Tzuriel & Haywood, 1991).

Whitman (1990) has proposed a theoretical model of mental retardation as a disorder in self-regulation which overlaps somewhat with the current model of motivational orientation and its relationship to cognitive processes as evolved by the Peabody-Vanderbilt Group. Whitman (1990) argues the persons with mental retardation have great difficulty regulating their own behavior and that in order to eliminate this problem, self-regulatory skills must be a primary goal of educators. The problem that the writer has with Whitman's general position is his over-generalization about the self-regulatory abilities of mentally retarded persons. The main thesis of the Peabody-Vanderbilt Group, and also in the writer's opinion of the Yale Group, is that there are significant individual differences in persons with mental retardation to self-regulate their own behavior which require that different strategies be used with different subpopulations of mentally retarded persons (e.g., intrinsically oriented vs extrinsically oriented mentally retarded individuals).

The research of the Peabody-Vanderbilt Group has been most productive in helping us understand the influence of effectance motivation and motivational orientation (intrinsic and extrinsic motivation) on the performance of retarded and nonretarded persons ranging from nonhandicapped preschooler, school-age, and middle-school children and mildly mentally retarded adults. There is much

overlap between the ideas and constructs of the Yale Group and the Peabody-Vanderbilt Group regarding the operation of personality and motivational processes in persons with mental retardation. Together the ideas of these research groups form a complimentary tapestry of overlapping ideas which in concert help us understand those historically "overlooked motivational and environmental variables" regarding individual differences in behavior in both mentally retarded and nonhandicapped persons.

The concept of motivational orientation has evolved systematically over the last 30 years recognizing the complex interplay of personality and motivational processes with cognitive processes within a developmental perspective which has brought it ever close to current ideas deriving from mainstream psychological thought concerning self-system self-regulatory processes. In the next section of the paper a brief review of some of these current concepts will be presented and their implications for understanding individual differences in personality and motivational systems in persons with mental retardation will be explored.

II. Implications Of Current Theoretical Conceptions Of Personality And Self-System Processes For Persons With Mental Retardation.

1. Theories of Intrinsic and Extrinsic Motivation

Modern theories of intrinsic and extrinsic motivation are complex structures each employing their own definition of intrinsic motivation, and each concentrating on very specific aspects of the learning process (ie., goal-setting/goal-value, expectations, efficacy, competence, autonomy, curiosity), though there is much conceptual overlap among theories.

The study of motivation has been confounded with the field of learning; indeed, motivation often is inferred from learning, and learning is the indicator of motivation for the motivational researcher, for good or for ill (Weiner, 1990). The period of the 1970's was focused on individual differences among learners independent from any broad concern about personality structure. Motivational theorists each created their own measures of intrinsic/extrinsic motivation, and ignored how their theoretical model related to or fitted in with other personality structures or with other operational definitions of intrinsic/extrinsic motivation invented by other motivational theorists. The creation of the individual

difference measure followed the successful manipulation of a situational variable that captured a particular motivational phenomenon. This was true both for the Yale Group and the Peabody-Vanderbilt Group of motivational researchers in the field of mental retardation as well as for researchers in mainstream psychology. The period of the 1980's emphasized that cognitions have motivational significance, and that self-system processes may be useful for understanding behavior, a set of ideas profoundly influencing the theoretical models of the Peabody-Vanderbilt Group. The period of the 1990's is dominated by varieties of cognitive approaches to motivation; the main theories today are based on the interrelated cognitions of casual ascriptions, efficacy and control beliefs, helplessness, and thoughts about the goals for which one is striving within the context of a theory of self-system processes, and how these models related to intrinsic/extrinsic motivation. The period of the 1990's is the period of "the Self", not as a cross-situational personality trait but as a domain-specific variable. (The success of the motivational models of the Peabody-Vanderbilt group have to do with the relatively undifferentiated state of self-system processes in mentally retarded and in the low mental age populations studied, whose self-system processes behave more like personality traits and show more cross-situational generality, than in nonretarded and older populations). However, current theories of intrinsic/extrinsic motivation are not highly focused or developed within a concise system of interrelated concepts as we shall see in this section. The vagueness and lack of theoretical elaborations reduces both the generality and precision of these intertwined approaches both in mainstream psychology and even more in the less developed area of intrinsic/extrinsic motivation in the area of mental retardation.

A. Goal Setting/Goal Value

Currently motivational researchers have focused on the perception of the reasons for task engagement, ie., goal-setting/goal-value. Individuals may perceive that they engage in tasks for extrinsic reasons (i.e., to achieve some goal unrelated to the task itself) or perceive that they engage in tasks for intrinsic reasons (for enjoyment or to develop competency). This distinction relates to the distinction current motivational theorists make between "learning goals"/"mastery goals"/"task goals" which motivate individuals to engage in tasks in order to develop mastery, understanding, increased competence, and learning new things; and "performance goals"/"ego goals" which motivate individuals

to validate ones' competence by obtaining positive judgments of ones' abilities (or avoid negative ones) by engaging in tasks in order to do better than others, to demonstrate more intelligence than others, or to win approval from others (Dweck & Leggett, 1988; Nicholls, 1984, 1989, 1990).

According to the Dweck and Leggett (1988) model, which is an extension of Atkinson's expectancy-value theory of achievement motivation (Atkinson, 1964), learning goals and performance goals have very different implications for how students behave in achievement settings and how they interpret performance outcomes. Motivational processes reflect an interplay of cognitive and affective factors that influence the initiation and maintenance of goal-directed striving (Dweck, 1989). Motivational patterns can be conceptualized as: (a) goal value: the salience and attractiveness of achievement goals; (b) goal expectancy: the subjective probability of goal attainment; and (c) means value: the attractiveness or aversiveness of the activities necessary for goal attainment. The child enters an achievement situation with a repertoire of cognitive skills and a motivational set of self-system processes consisting of (a) beliefs: favored views about the nature of competence, the level of one's competence, and beliefs about what variables influence outcome; (b) inference rules: favored modes of computing task difficulty, and deciding the causes of outcomes; (c) salient representations: tendencies to focus on aversive or pleasurable means or on desirable or undesirable outcomes; and (d) values and interests: ones' personal hierarchy of what is important and enjoyable. Environmental-demand situational characteristics (e.g., about the task, the evaluator, the reward) are interpreted through one's cognitive skill repertoire and one's motivational set (one's self-system processes) in terms of goal value, goal expectancy, and means value leading to a course of action concerning which achievement goals to pursue and how to pursue them. The performance and outcomes of the individual feed back into the cognitive/motivational self-system possibly altering the goal value, and/or, the goal expectancy, and/or, the means value, thus altering the performance of the individual.

Students with learning goals, independent of their perceptions of their intellectual abilities, seek challenging tasks that provide opportunities to develop new competencies and perceive their teacher as a mentor in the learning process rather than as an evaluator. When these students have difficulties solving problems, they assume that their current strategy of problem-solving is inappropriate and needs

to be changed, or that they are not trying hard enough. Accordingly, they analyze their problem-solving strategy and try harder. For students with learning goals, judgments of competence are based on the amount of effort expended and the real learning or mastery achieved. Students with performance goals, are motivated to validate their competence, or at least not to appear incompetent. These students perceive the teacher as a judge/rewarder-punisher, rather than as a mentor, and their validations of competence are based on performance relative to others or to external feedback, not on real gains in understanding, competence, or mastery. Those who are confident in their ability choose moderately difficult tasks to allow themselves to validate their competence and because they are confident that they will succeed when they encounter difficulty in solving problem-solving tasks they will engage in effective strategy behaviors. However, because their goal is to be perceived (validated) as competent (as opposed to be truly competent), they may use shortcuts which achieve their immediate goals but do not actually foster real learning. Students who have performance goals but lack confidence in their ability, choose easy tasks to avoid displaying incompetence. When these students encounter difficulty in solving problems, they either engage in self-defeating strategies to avoid being perceived as low in ability, or give up entirely because they don't perceive themselves as demonstrating competence.

All individuals pursue "learning and/or performance" goal structures. The primary question is what variables determine which goal structures are operational when choices have to be made? Dweck (1985) believes that the particular goal-structure chosen is a function of environmental-demand situational characteristics and individual differences among learners regarding one's motivational set. In situations when normative standards of success, as opposed to personal or autonomous standards are made more salient, children will ignore learning opportunities and pursue performance goal-structures such as selecting tasks that will allow them to validate high ability or conceal low ability. When instead, the value of the task for its own sake is made more salient, stressing the personal progress of each learner, children will choose the learning goal-structure, ie., they will select a task that maximizes learning, but involves the risks of errors and confusion. Children under this environmental-demand condition regardless of their perceived level of ability, will choose to forego the chance to validate their high ability or conceal their low ability in favor of the learning opportunity (Elliott & Dweck, 1981). There

also appear to be strong individual differences in children's tendency to be motivated to pursue "learning" or "performance" goals in situations where the environmental-demand situation is ambiguous, i.e., situations that do not emphasize one learning goal-structure over the other (Bandura & Dweck, 1981; Dweck & Bempechat, 1983). Students were introduced to experimental tasks or asked to think about classroom situations in which the teacher is about to present new material. Students were then asked to indicate their preference for the type of problem or materials they would like to work on, with each choice representing a learning goal (e.g., "Problems that I'll learn something from, even if they're so hard that I'll get a lot wrong") or a performance goal ("Problems that aren't too hard, so I don't get many wrong": "Problems that are hard enough to show that I'm smart"). Children demonstrated strong individual differences in their choice of goal-structures which were independent of the students' level of ability at the task or of the level of their school achievement. Children with learning goals were more likely than children with performance goals to say that they would feel smarter after a high effort mastery experience than after a low effort mastery experience. When asked to indicate their affective reactions to low-effort mastery, children with learning goals were more likely than children with performance goals to choose "bored" or "disappointed" over "proud" or "relieved". Performance goals and learning goals are differentially association with a kind of weariness or lack of stamina in the face of obstacles. The more a child is focused on learning or progress, the greater the likelihood of maintaining effective strategies (or improving one's strategies) under failure experiences (Elliott & Dweck, 1981). A challenging task in which one exerts high effort with few apparent obstacles is a potent builder of competence. Those children operating under a performance-goal orientation, low expectancies of success may lead them to avoid the very tasks that foster learning, i.e., mastery experiences, and build competence, or at the least pursue them in ineffective ways. Elliott and Dweck (1981) also found that inspite of obstacles to learning, children with learning goals did not attribute outcomes to lack of ability, to show disruption in performance, or to exhibit negative affect, even if they perceived themselves as having low ability relative to others in contradiction to children with performance goals who showed the opposite types of responses.

The evidence suggests (Bandura & Dweck, 1981; Elliott & Dweck, 1981), that the characteristics of the learning situation have a lot to do with fostering and maintaining interest in the task. Challenging tasks and ones that pose obstacles are less likely to create negative affect (and more likely to create positive affect) for children with learning goals as compared to children with performance goals. High effort is itself more likely to be experienced as pleasurable in a learning situation (where effort engenders pride in one's work) than in a performance situation (where effort can be associated with the shame of displaying low ability). Learning goals may foster a greater sense of personal control, which is associated with greater intrinsic motivation, greater task interest and enjoyment. Performance goals may involve situations that imply that others control outcomes or constrain behavior, conditions associated with a decline in intrinsic motivation and a concomitant increase in extrinsic motivation.

The child's beliefs concerning the child's conception of the nature of intelligence ("smartness") are associated with different achievement goal structures. Bandura and Dweck (1981) found that children who believed in the "incremental" theory of intelligence of smartness as a dynamic growing quality (e.g., "Smartness is something you can increase as much as you want to") were significantly more likely to adopt learning goals on an experimental task than children who believed in the "entity" theory of intelligence of smartness as a fixed static trait (e.g., "You can learn new things, but how smart you are stays pretty much the same") who were more likely to adopt performance goals. Children who believed that smartness was malleable chose tasks that would increase their competence, whereas children who believed that smartness was a stable trait were more likely to choose tasks that would secure a positive judgement of their existing competence or avoid a negative judgement. Children who believe in an incremental theory of intelligence may ask themselves: What can I learn? How can I figure this out? Children who believe in an entity theory of intelligence may ask themselves: Can I do it? Will I look smart? Will I reveal my ignorance? Younger preschool children appear to have a more incremental view of intelligence, however by the middle-school years (grades four and five) children become increasingly aware of an entity view of intelligence and develop maladaptive behaviors such as task avoidance and performance impairments.

Kindergarten and first grade children have high perceptions of their abilities, and have very high expectancies of success that are very stable even under repeated failure experiences. They do not focus on task failure, or perceive task failure as indicative of low abilities. They name intrinsic factors such as learning goals or interest in the work as reasons for their school work, as opposed to extrinsic factors, and they tend to use personal standards such as mastery or task completion rather than normative standards for judging their success (Dweck, 1989; Stipek, 1984). By the second and third grades, children's self-ratings match their report- card grades and teachers' ratings, their expectancies become more conservative, their confidence declines under failure experiences, and failure experiences begin to have an impact on their ratings of their own task abilities (Nicholls 1979a, 1979b). By the fourth and five grades, children's achievement behavior reflects their belief system, whether accurate or not. Attributions of failure to lack of ability are now associated with lowered persistence and impaired performance.

Dweck (1989) suggests that the nature of tasks, (i.e., the shift from concern with physical tasks such as skipping, and cognitive tasks with clear concrete or physical components such as puzzles which can be self-chosen, independently pursued, and self-judged; to increasingly intellectual and abstract school-tasks which are more confusing and ambivalent to the child and may require the judgement of others), and the changing conceptions of ability (from an incremental theory to an entity theory) render difficult the maintenance of learning goals and set the stage for the emergence and stabilization of maladaptive patterns.

Weisz (1990) has shown that psychosocially mentally retarded children, because of their lifetime exposure to failure experiences, appear to be more susceptible to learned helplessness (i.e., a learned perception that one cannot control outcomes, Abramson, Seligman, & Teasdale, 1978) than are nonretarded children. Psychosocially mentally retarded children show extreme performance deterioration in problem-solving ability in response to failure feedback. Psychosocially mentally retarded children may have high expectancy of failure; when confronted with failure experiences, they may just stop performing.

Dweck and Leggett (1988) integrated the learned helplessness construct into their model of achievement motivation. Helpless students are characterized by ego-involvement. Their school goals are to complete tasks and avoid negative judgments of their competence. They have an entity concept of intelligence. They avoid challenges, display low persistence in the face of difficulty, hold low perceptions of their capabilities and display anxiety while engaged in tasks. In contrast, mastery-oriented students display a task-involved achievement pattern. They have an incremental concept of intelligence, and their school goals are to learn and become more competent. They hold high perceptions of their learning capabilities, frequently seek challenges, and persist at difficult tasks. Mastery-oriented and helpless students do not really differ in fluid intelligence. Although helpless students often possess cognitive skill deficits, these alone do not cause failure. Not all students with learning problems enter this cycle; some continue to feel confident and display positive attributional patterns. One factor that may be important is frequency of failure.

Nicholls' theory of goal setting (Nicholls 1979b, 1983, 1989) distinguishes between task goals/learning goals where students are focused on completing the task that they are motivated to learn or master in terms of a self-referenced definition of success as the gaining of insight or skill or accomplishing something that is personally challenging (i.e., task-involvement/task orientation); and ego goals/performance goals (i.e., ego-involvement), where students are focused on themselves and especially on external evaluation of the self in terms of a definition of success where students must establish their ability as superior to those of others (i.e., ego-involvement/ego orientation). Ego orientation means that though one might seek to learn, to gain insight, or to perform one's best, these efforts would not be as they are in task orientation as ends in themselves, but as means to the ends of establishing one's ability as superior. In adult through junior high school populations (Nicholls, Patashnick & Nolen, 1985; Nolen, 1988; Maehr & Braskamp, 1986), the goal dimensions of task and ego orientation are independent of each other and do not form a single bipolar dimension. A third orientation, work avoidance, is negatively related to task orientation and unrelated or positively related to ego orientation.(Nicholls, et al., 1985; Thorkildsen, 1988). To ego-oriented students, it might be expected that the concept of ability would be very important and that success as they define it would be

viewed as dependent on superior ability. To task-oriented students, concepts of learning, understanding, and effort would be important and attempts to make sense of instructional-domains would appear to be essential for success. Ego -involvement is increased by situations that are test-like, where interpersonal competition is emphasized, and by feed-back that focuses attention on one's standing relative to others. Such situations tend to undermine intrinsic involvement (intrinsic motivation in learning situations). Negative effects on performance and level of aspiration of low perceived ability are more evident in such ego-involving contexts than in neutral or task-involving contexts. In ego-involving contexts, students with low-perceived ability generally show more unrealistic levels of aspiration and more impaired performance. When this pressure is absent, students with low- and high-perceived ability (academic self-concept) generally perform similarity. Therefore, rather than asking how we can we increase students' self-concepts of ability, we might ask how can we encourage students to be task-involved rather than ego-involved, to focus on the work at hand, on the problem to be solved, to create classrooms where students perceive success as dependent on collaboratative attempts to construct meaning, rather than on how able they are because task and ego orientations are not significantly correlated with perceived ability (academic self-concept). Research supporting this analysis has been obtained with older students with reference to general school instruction (Nicholls, 1984, 1989, Thorkildsen, 1988; Nicholls, Cheung, Lauer, & Patashnick, 1989, Nolen, 1988) and in second graders (Nicholls, Cobb, Wood, Yackel, & Patashnick, 1990; Nicholls, Cobb, Yackel, Wood, & Wheatley, 1990) with reference to mathematics instruction.

Task-involvement is associated with the use of effective problem-solving strategies (metacognitive strategies), as well as increased intrinsic motivation, whereas ego-involvement is associated with superficial and inefficient problem-solving strategies, and an extrinsic motivational orientation (Meece, Blumenfeld & Hoyle, 1988; Pintrich & Schrauben, 1992). Ames and Archer (1988) found that the more junior high school students perceived their classroom to support mastery rather than performance goals, the more they used active metacognitive strategies to facilitate their academic learning. Nolen (1988) found in junior high school students, that task orientation was strongly associated with deeper levels of information processing.

Task-involvement is associated with more constructive beliefs about the cause of success (Nicholls, Cobb, Wood, Yackel & Patashnick, 1990). The seven year old children in the Nicholls, Cobb, Wood, et al. (1990) study who were relatively more task-oriented (where the goal was to gain understanding) were more likely to believe that success in mathematics was caused by effort, attempts to make sense of things, and cooperation with one's peers, whereas students who were more ego-oriented (where the goal was to be superior to others) believed that success in mathematics was caused by superior ability and attempts to beat others.

In some situations Task/Ego Orientation is related to perceived ability. In ego-involving situations, it would probably be difficult for students who believe they have low ability (who would, therefore, expect to reveal themselves as incompetent) to remain actively and unself-consciously involved in performing their best or improving their understanding. In such situations, students with high perceived ability would seem to be at some advantage when it comes to maintaining task involvement and satisfaction, though in general ego-involving contexts undermine task involvement and low-perceived ability predicts impaired performance and extreme risk-taking in ego-involving more than in task-involving contexts (Nicholls et al., 1989).

Nicholls and his colleague have studied children's understanding of ability and effort as determiners of behavior (Nicholls, 1989, 1990). Preschool children do not differentiate between ability and effort, and assume that individuals who try harder are smart and individuals who are smart try harder. If an individual succeeds on a task, that individual must be smart, and must have worked harder. If an individual fails on a task, that individual must be dumb, and must have not worked hard enough. Young children do not judge ability with reference to performance norms or social comparisons but usually make self-referenced judgments of ability. Starting between seven and nine years, children see effort as the primary cause of performance outcomes. It is around 11 or 12 years of age, that children distinguish among performance, effort, and ability, i.e., have a differentiated or mature concept of ability, where ability is judged in relation to others and high ability means above average ability. Younger children have an undifferentiated concept of ability based on perceptions of mastery or learning; the more children believe they have learned, the more competent they feel. Behavior directed

at developing or demonstrating ability in the less differentiated sense encompasses what White (1959) has called competence motivation. Task involvement refers to internal states where the concern is to develop or demonstrate (primarily to oneself) high ability in the less differentiated sense. Ego involvement refers to internal states where the concern is with developing or demonstrating (to oneself or others) high rather than low capacity in the differentiated sense.

The development of a mature concept of ability has important implications for children's perceptions of the value of effort. Although young children understand that effort does not always produce success, they assume that mastery following high effort always indicates high ability. By early adolescence, children understand that when two children obtain the same outcome, the one exerting the higher effort is judged to have lower ability. For adolescents, therefore, whether mastery following high effort indicates high or low ability depends on others' as well as one's own effort and performance, and under some circumstances, high effort can be used as evidence for low ability if others require less effort for the same performance. Effort is a two-edged sword (Covington & Omelich, 1979) but only for adolescents. When one is working on skill tasks, factors that increase concerns about evaluation of our ability will increase use of the differentiated concept of ability, and ego-involvement, (e.g., test situations, interpersonal competition). However depending on the demand characteristics of the environment, adults can use either the more-or the less-differentiated conception of ability (Nicholls, 1984).

What learning environments or beliefs concerning the purposes of education support a task-orientation (Nicholls, 1989; Nicholls et al. 1989; Thorkildsen, 1988)? Task Orientation was associated with the view that the school should help one to do work that will be socially useful, to be an informed citizen, and to work hard and creatively despite obstacles, and the beliefs that academic success is associated by working collaboratively, being interested, and trying to understand rather than merely memorize, i.e., task orientation is associated with a tendency to perceive oneself as having social responsibilities and to perceive others as resources for learning. Work Avoidance was negatively associated with these views and positively associated with the view that the purpose of school is to help one gain wealth and social status. Ego Orientation was strongly associated as well with wealth and

status as the aims of education and the beliefs that success depends on trying to beat others and having teachers think you will do well. Nicholls (1989) and Nicholls et al. (1989), believe that to understand the academic motivation of students requires that researchers study students within a holistic perspective taking into consideration the "self-sustaining philosophies" of students, their ethical and political values and their idiosyncratic interpretations of the purposes of education and of curriculum content (ie., the meaning of life in school, and the meaning of life in general) with in an ecological approach to social cognition where thought and action are interpreted in terms of the thinker's purpose. The task of changing the motivation of students involves the changing of their self-sustaining philosophies concerning their views about society and themselves. For Nicholls and his colleagues, Nicholls, Cobb, Yackel et al. (1990), the ideal classroom involves "conflict of ideas without a conflict of egos which is the essence of progressive, constructivist education and life" (p. 145).

The main strategy in maintaining positive achievement related beliefs is to develop an incremental concept of ability and a task orientation for all students because students learn optimally when they concentrate on mastering the skill to be learned rather than on their normative performance compared to other members of the class. This will lead to feelings of competence, personal responsibility, and pride even in students who believe that their academic ability is lower than their classmates (Nicholls et al., 1989).

B. Self-Efficacy

Bandura (1986a, 1986b, 1991, 1992, 1993) more recently has written about the idea of personal agency, i.e., the idea that individuals take responsibility for their actions and impute success and failure to the goals they choose, the resources they mobilize, and the effort they expend. Perceived self-efficacy, ie., beliefs concerning one's capabilities to organize and implement actions necessary to attain designated levels of performance, is one of the most important constructs in Bandura's (1986a, 1991, 1992, 1993) social-cognitive approach and a critical component of personal agency because self-perceptions of one's ability to behave in a particular way establish one's expectations and motivation.

Three different theoretical models of cognitive motivators influencing the self-regulation of motivation involving perceived self-efficacy can be distinguished (Bandura, 1991, 1992, 1993): (1)

attribution theory and casual attributions, (2) expectancy-value theory and outcome expectancies, and (3) goal theory and cognized goals. Self-efficacy beliefs operate in each of these theoretical models of cognitive motivation. Self-efficacy beliefs influence individual's casual attributions regarding the perceived causes of success and failure. Individuals who regard themselves as highly efficacious ascribe their failures to insufficient effort; those who regard themselves as inefficacious attribute their failures to low ability (Alden, 1986; Collins, 1982; McAuley, Duncan, & McElroy, 1989). Casual attributions affect motivation, performance, and affective reactions mainly through beliefs of self-efficacy (Chwalisz, Altmaier, & Russell, 1992; McAuley, 1991; Schunk & Gunn, 1986; Schunk & Rice, 1986). In expectancy-value theory, motivation is controlled by the individual's expectation that their behavior will result in certain outcomes with particular values. The motivating potential of outcome expectancies is partly the results by the self-beliefs of individuals regarding what they can do, as well as their beliefs about the likely outcomes of performance, ie., their perceived self-efficacy. The usefulness of expectancy-value theory is increased by including self-efficacy determinants (de Vries, Dijkstra, & Kuhlman, 1988; Dzewaltowski, Noble, & Shaw, 1990; Madden, Ellen, & Ajzen, 1992; McCaul, O'Neill, & Glasgow, 1988; Wheeler, 1983). Goal theory is based on the motivational aspects of cognitized personal and evaluative goals operating in the present (Locke & Latham, 1990) mediated through self-influence processes. Motivation based on goal setting involves a cognitive comparison process. Individuals make their self-satisfaction conditional on matching adopted goals, thus giving direction to their behavior and creating incentives to persist in their efforts until they fulfill their goals and are prompted to intensify their efforts when discontented with substandard performances. Proactive control of motivation is possible as well (Bandura, 1993).

Students' efficacy beliefs influence achievement behaviors including: choice of task, persistence, effort expenditure, skill acquisition, and the selection and construction of the individual's environment. Students' behaviors and the demand-conditions of the environment can modify their efficacy beliefs in a reciprocal fashion according to the principle of reciprocal determinism. A strong belief in one's ability to use specific actions effectively (high perceived self-efficacy) enhances successful performance, and enhances feelings of pride, satisfaction, and self-respect, whereas, a weak

belief in one's ability to use specific actions effectively (low perceived self-efficacy) depresses performance and enhances feelings of guilt, failure, dissatisfaction, and low self-respect (Schunk, 1989a, 1989b, 1990). Efficacy beliefs influence how individuals feel, think, motivate themselves, make casual ascriptions, and behave (Bandura, 1993).

Students who have a low sense of self-efficacy are especially vulnerable to achievement anxiety. Meece, Wigfield, and Eccles (1990) have shown that former academic successes and failures arouse achievement anxiety through their effects on student's perceived self-efficacy. Failure may decrease students' sense of efficacy and they become anxious about scholastic demands made on them. If their perceived self-efficacy is strong, their perceived self-efficacy can withstand academic failure experiences and they can remain optimistic and calm. Student's beliefs in their capabilities to master academic subjects predict their subsequent academic attainments. Their level of scholastic anxiety is unrelated to subsequent academic performances.

In Bandura's (1986a) social cognitive learning theory, "Learning is largely an information-processing activity in which information about the structure of behavior and about environmental events is transformed into symbolic representations that serve as guides for action" (p.51), and inform and motivate the individual so that expectations about future outcomes can be created. Learning occurs enactively by the consequences of the individuals' own actions (behaviors associated with successful consequences are retained, those that yield failure are discarded), or vicariously in the absence of overt behavior by individuals usually by observing models (by watching actual events, or through the media by reading books, by movies, by the radio, or by television). Response consequences from enactive and vicarious sources inform and motivate the observers. Vicariously observed behavior that leads to success and is deemed useful to learners is retained, whereas vicariously observed behavior that leads to failure or is deemed useless is not retained. Most learning is a combination of enactive and vicarious sources operating through enhancement or diminishment of the individuals' outcome expectations which influence perceived self-efficacy.

Individuals acquire information about their self-efficacy in a given content domain from their enactive performances, vicarious experiences, social persuasion from others, and physiological states

(e.g., physiological signs of anxiety: increased heart rate, gastric distress, headache, increased sweating). One's own performance provides the most valid information concerning one's self-efficacy (success raises it, whereas failure lowers it). Vicarious normative experiences (Marshall & Wienstein, 1984; Rosenholtz & Simpson, 1984) provide information regarding one's ability compared to others in the group (e.g., if one believes one is "better" than others in the group, self-efficacy is increased, if one believes that one is "worse" than others in the group, self-efficacy plummets; observing individuals similar to oneself succeed increases self-efficacy, if similar persons fail, self-efficacy decreases). Social persuasion from others providing positive supportive informational feedback (e.g., "You can do the task") can increase perceived self-efficacy. Performance feedback that emphasizes achieved progress can enhance perceived self-efficacy. Performance feedback that emphasizes deficient progress underscores personal deficiencies and decreases performance (Bandura, 1993).

Physiological responses reflecting anxiety states provide information to the individual that can lower perceived self-efficacy, whereas physiological states of calmness and tranquility provide information to the individual that can increase perceived self-efficacy.

An additional cognitive mechanism in Bandura's (1986a, 1992, 1993) model operates through goal setting which involves establishing an internal standard and objective to focus one's actions, and the self-evaluation of one's progress. Motivation based on goals or standards is regulated by three types of reactive self influences: (a) affective reactions to one's performance, (b) perceived self-efficacy for goal attainment, and (b) readjustment of personal goals based on one's progress. Self-efficacy beliefs determine the goals individuals set for themselves, how much effort individuals expend, how long individuals persevere in the face of difficulties, and their resilience to failures. Individuals who have strong beliefs in their self-efficacy exert even greater effort when they fail to meet the challenge. Individuals who have weak beliefs in their self-efficacy, when confronted with obstacles and failure experiences diminish their efforts or give up entirely.

As individuals work on the task, they compare their current performance with their goals. Perceived negative discrepancies create dissatisfaction which usually leads to additional effort. The more specific the goal, the more motivation (effort) to accomplish the goal, and more perceived self-

efficacy is enhanced, because individuals can more readily assess their progress toward goal accomplishment. Goals that are short-term (proximal) also increase effort and perceived self-efficacy because progress toward goal accomplishment is perceived as achievable. Goals that are perceived as moderately challenging but attainable (high expectations for success) also increase effort and perceived self-efficacy compared to very easy or very hard goals.

Bandura and Cervone (1986) demonstrated in a study of complex human decision making in which the direction and magnitude of discrepancy between performance and a difficult assigned goal were varied. As more sources of self-reactive motivational self-influences (e.g., strong perceived self-efficacy for goal attainment, self-dissatisfaction with substandard performance, and adoption of challenging standards) individuals energized, the higher the effort they exerted to attain their goals.

Schunk (1984) in a study of perceived mathematical self-efficacy in children's mastery of mathematical competencies showed that perceived self-efficacy contributes to the development of cognitive skills directly, and by indirectly sustaining persistence.

The perceived controllability of the environment affects self-regulatory factors that govern cognitive functioning (Bandura, 1993). There are two aspects: The first concerns the level and strength of personal efficacy to produce changes by perseverant effort and creative use of capabilities and resources, and the second aspect concerns the modifiability of the environment, ie., the constraints and opportunities provided by the environment to exercise personal efficacy. Individuals who are self-doubters anticipate the futility of efforts to modify their life situation. They can produce little change in their performance outcomes even in environments that produce many potential opportunities. On the other hand, individuals who strongly believe in themselves, in their personal efficacy, can through ingenuity and perseverance determine ways of exercising some control, even in constraining environments containing limited opportunities. Bandura and Wood (1989) demonstrated the influence of the perceived controllability of the environment in a study of perceived managerial self-efficacy, the performance goals set for the organization, and the level of organizational performance for managers who operated under a cognitive belief that organizations are controllable or difficult to control. One group of individuals managed a simulated organization with the belief that group behavior is not easily

influenceable. These managers quickly lost faith in their capabilities, even when performance standards were within easy reach. These managers lowered their aspirations, and their group's performance deteriorated. One group of individuals managed a simulated organization with the belief that group behavior is easily influenced. These managers exhibited a highly resilient self-efficacy, even in the face of numerous difficulties; set themselves increasingly challenging goals; and using good analytic thinking achieved a high level of group performance.

Wood and Bandura (1989a) in business students, found that the students' theory of intelligence (i.e., entity or incremental) influenced their self-efficacy. Students with an incremental orientation, maintained high self-efficacy, and set more challenging goals compared to entity oriented students who showed a decline in self-efficacy. A path analysis of the Bandura and Wood (1989) and the Wood and Bandura (1989a) studies show that initially individuals rely heavily on their past performance in judging their efficacy and setting their aspirations. As individuals begin to form a self-schema about their efficacy through further experience, their performance attainments become powered more strongly and intricately by their belief in their personal efficacy. Perceived self-efficacy influences performance both directly and through its strong effects on goal setting and analytic thinking. Personal goals, in turn, enhance performance attainments through analytic strategies (Bandura, 1993; Wood & Bandura, 1989b).

Performance is also affected by the beliefs individuals have about how their abilities change over time. Individuals who conceptualize abilities as a biological diminishing capacity with increasing age interpret faulty performances as indicators of declining capacity and have more of an entity theory of intelligence. Individuals who view abilities as a skill that must be developed and practiced (have more of an incremental theory of intelligence) achieve higher performance outcomes. Berry (1987) found that the more older adults believe in their memory capabilities, the more time they devote to cognitive processing of memory tasks which produces better memory performance. Perceived cognitive self-efficacy using path analysis affects memory performance both directly and indirectly by raising cognitive effort. Thus personal goal setting is influenced by self-appraisal of capabilities. The stronger the

perceived self-efficacy, the higher the goal challenges individuals set for themselves and the firmer is their commitment to them (Bandura, 1991, 1993).

Many theories of motivation involve a negative discrepancy between one's perceived performance and an adopted standard which motivates the individual to reduce the discrepancy. There also exists a proactive control of motivation. Individuals motivate and guide their actions through proactive control by setting for themselves challenging goals that create a state of disequilibrium and then they mobilize their skills and effort to meet their goals. After goal attainment, individuals with a strong sense of efficacy set higher goals for themselves. Adopting further challenges creates new motivating discrepancies to be mastered (Bandura, 1993). Individuals' beliefs in their efficacy influence the types of anticipatory scenarios they construct and rehearse. Individuals who have a high sense of efficacy visualize success scenarios that provide positive guides and supports for performance. Individuals who doubt their efficacy visualize failure scenarios and dwell on the many things that can go wrong (Bandura, 1993). Bandura's (1993) model of self-motivation involves a dual control process of motivating discrepancy production followed by discrepancy reduction.

Ability according to Bandura (1993) is not a fixed attribute residing in one's behavioral repertoire. It is generative capability in which cognitive, social, motivational, and behavioral skills are organized and effectively orchestrated. It also involves controlling aversive emotional reactions that can cloud the quality of one's thinking and one's action. Possessing knowledge and the ability to use that knowledge requires not only metacognitive skills and strategies but also strong self-beliefs of efficacy.

Perceived self-efficacy interacts with achievement level and problem-solving efficiency (Collins, 1982). Collins selected children at three levels of mathematical ability: low, medium and high. Within each of these ability levels, she found children who were confident of their perceived mathematical self-efficacy and others who had self-doubts. All were given difficult problems to solve. At each level of ability, children who believed strongly in their capabilities more quickly discarded false strategies of problem solution and solved more problems. They chose to rework more of the problems they failed and did more accurately than did children of equal ability who were hampered by greater feelings of self-doubt. Positive attitudes toward mathematics were better predicted by perceived self-efficacy than

by actual ability. Individuals who manifest poor performance may do so because they lack the metacognitive strategies, or because they lack the sense of efficacy to use them well, or both. Bouffard-Bouchard and his colleagues (Bouffard-Bouchard, 1989; Bouffard-Bouchard, Parent, & Larivee, 1991) have extend this work to junior and senior-high school age students where they replicated the contributions of perceived self-efficacy to cognitive performance.

Schunk (1985) in a study with learning-disabled sixth graders receiving instruction in subtraction skills varied how learning goals were assigned to students. Some students set their own goals, others had comparable goals assigned by others, and some students worked without goals. Students who set their own goals

had the highest level of self-efficacy and subtraction performance. Students who set their own goals or were assigned goals showed greater self-regulated learning compared to students who worked without goals. Students who set their own goals judged confidence for attaining goals higher than students who were assigned goals.

Schunk (1989a, 1989b) in a series of studies with deficient learners in the content domains of mathematics and language skills provided a program of self-directed learning where the material is structured in easily mastered subskills supplemented with instructional social influences (e.g., verbal modelling of cognitive strategies, proximal goal setting, ability and effort attributional feedback, positive incentives, and self-verbalization of task strategies) designed to enhance the learner's sense of academic efficacy. He found that indeed the interventions built up the learner's beliefs in their intellectual capabilities. The higher the learner's perceived efficacy, the better they perfected their cognitive capabilities. In Bandura's model (1993), self-efficacy is influenced by skill acquisition, but is not merely a reflection of them; learners with the same level of cognitive skill development differ in their intellectual performance as a function of the intensity of the learner's self-efficacy.

Horn and Murphy (1985) in a study with college students classified as high or low in achievement motivation on an anagram task set their own work-goals or were assigned comparable work-goals. Students judged confidence for goal attainment (a measure analogous to self-efficacy). Students high in achievement motivation performed equally well under the two goal conditions, whereas

self-set goals enhanced the performance of students low in achievement motivation. No differences emerged in confidence, perhaps because of ceiling effects in this measure. Perhaps if the motivational orientation of the subjects in these studies had been assessed, the data would have been more interpretable.

Bandura's (1993) expanded the breadth of his model to acknowledge that efficient self-directed learning is a function of motivational, cognitive, and metacognitive strategies. These motivational aspect of self-directed learning encompassed a variety of interlinked self-referent processes including self-monitoring, self-efficacy appraisal, personal goal setting, outcome expectations, and affective self incentives (Bandura, 1986a, 1991; Zimmerman, 1990). Zimmerman, Bandura, and Martinez-Pons (1992) in minority high school students, studied students' perceived self-efficacy to structure environments conductive to learning, their ability to plan and organize their academic activities, their ability to use cognitive strategies to enhance understanding, their ability to obtain information and get teachers and peers to help them when needed, their ability to motivate themselves to do their school work, their ability to get themselves to complete scholastic assignments within deadlines, and their ability to stick to academic activities when there are more interesting things to do. The higher the students' self-regulatory efficacy, the more assured they were in their efficacy to master academic subjects. Perceived self-efficacy for self-regulated learning directly affected perceived self-efficacy for academic achievement which directly influenced students' grades, and perceived self-efficacy for self-regulated learning indirectly influenced students' grades by its effect on perceived self-efficacy for academic achievement which directly caused students' grade goals to increase thus increasing students' grades. Additionally, when parents' personal grade goal aspirations concerning their childrens' academic achievement were considered, it was found that this variable influenced students' grades indirectly through their influence on their childrens' grade goals which directly influenced their actual grades. It is not sufficient for parents to set academic standards for their children, unless parents additionally increase their children's sense of efficacy, their children are likely to view high standards as beyond their reach and disregard them.

Zimmerman and Bandura (1992) have done research on the development of writing skills as a function of perceived self-efficacy and other self-regulatory factors. Enhancement of perceived writing efficacy by instruction raises, through different paths of influence, perceived self-efficacy for academic activities, personal standards for the quality of writing considered self-satisfying, and academic goal and attainments. Whereas, verbal aptitude affects academic performance only indirectly by raising personal standards of writing, the increased sense of academic efficacy promotes academic performance both directly and by heightening aspirations.

Caprara, Pastorelli, and Bandura (1992) studied the changes in perceived self-efficacy over a variety of domains (e.g., efficacy for self-regulated learning and mastery of academic subjects; efficacy to form and maintain social relationships; efficacy to resist peer pressures to engage in alcohol and drug abuse as well as unprotected sex; and perceived self-efficacy to meet personal and social expectations) developmentally in Elementary and Junior High School Children. A principal components factor analysis of these different aspects of self-efficacy was performed which yielded three factorial domain of self-efficacy: Perceived Self-Regulatory, Academic, and Social Efficacy. These domains of self-efficacy were related to different patterns of interpersonal and emotional behavior.

Elementary and Junior High School Children who have a strong sense of Academic and Self-Regulatory Self-Efficacy manifest more prosocial behaviors (as determined by their own self-ratings, teacher ratings, and peer ratings) and are more popular as determined by their peer ratings, and experience less rejection by their peers than do students who believe they lack Academic and Self-Regulatory Self-Efficacy. Students who have a weak sense of Academic and Self-Regulatory Self-Efficacy manifest more emotional irascibility, physical and verbal aggression, and ready disengagement of moral self-sanctions from harmful conduct (as by their own self-ratings, teacher ratings, and peer ratings). The impact of children's disbelief in their Academic Efficacy on socially discordant behavior becoming stronger with increasing age.

The relationship of Perceived Social Efficacy to social and emotional behavior changes with age. For the Elementary School Children, Perceived Social Self-Efficacy is not significantly related to emotional and interpersonal patterns of behavior, however Academic and Self-Regulatory Self-Efficacy

were. For the Junior High School Children, their social and emotional behavior were related to their Perceived Social Efficacy, their Perceived Self-Regulatory Efficacy, and their Perceived Academic Self-Efficacy presumably as a result of their longer history of both success and failure experiences compared to the younger children.

Sociocognitive theory promotes a multifaced approach to promoting cognitive development (Bandura, 1993). Ability is viewed as a trait which can be changed and which can be controlled by the self. Bandura (1986a) views guided mastery as the principle technique for the promotion of competence. In this approach, cognitive modeling and instructional aids are used to convey relevant knowledge and strategies to the learner in graduated steps. Diverse opportunities are provided for guided practice in when and how to use cognitive strategies in the solution of diverse problems. Activities, incentives, and personal challenges are structured in ways that ensure self-involving motivation and continual improvement. Instructional aids are progressively reduced as student's competencies are expanded. Self-directed mastery experiences are arranged to strengthen and generalize the student's sense of personal efficacy. Each of these modes of influence is structured in ways that strengthen students' self-beliefs that they have what it takes to exercise control over their self-development.

How does one assess self-efficacy in elementary or middle school students usually studied by Schunk? Subjects are initially pretested on self-efficacy by exposure to samples of the academic content domain (math, reading) and asked to judge their certainty of solving problems like those shown (from "not sure" to "really sure") using a self-rating scale or an analogue motor-task like jumping (e.g., the length of the jump is proportional to the certainty of the judgement); thus subjects judge their capabilities for solving different problems and not whether they can solve particular problems. Treatment procedures are subsequently implemented in conjunction with a multisession instructional program on the content-area skill domain involving teacher instruction, student guided practice, and student independent practice. Finally, students are posttested on completion of the instructional program.

The creation of environments supportive of learning depends of course on the talents and the self-efficacies of teachers in their creation of an appropriate classroom climate. Gibson and Dembo (1984) found that teachers who had a strong sense of instructional self-efficacy devoted more classroom time to academic learning, provided inefficient learners with the help they needed to succeed, and praised these inefficient learners genuinely for their accomplishments. On the other hand, teachers who had a weak sense of instructional self-efficacy spent more classtime on nonacademic activities, gave up easily on inefficient learners, and criticized these inefficient learners for their failures. Thus, teachers who believe strongly in their instructional self-efficacy create mastery experiences for their students. Teachers with a weak belief in their instructional self-efficacy construct classroom environments that undermine their students' sense of self-efficacy and restrict their cognitive development.

Woolfolk and Hoy (1990) found that teachers' sense of personal efficacy affected their general orientation toward teaching as well as their specific instructional practices. Teachers who had a low sense of instructional efficacy had a custodial orientation that uses extrinsic reinforcers and punishment to force students to learn, similar to what Deci and Ryan (1985) have called a "controlling" classroom environment. Teachers who had a strong sense of instructional efficacy support the development of students' intrinsic motivation and academic self-directedness, similar to what Deci and Ryan (1985) have called an "autonomous" classroom environment. Ashton and Webb (1986) also have documented the cumulative effect of teachers' instructional self-efficacy on students' academic achievement. Teachers' beliefs about their instructional efficacy predict students' level of mathematical and language achievement over the academic, if students' initial abilities are controlled through covariance techniques.

Efficacy effects operate as well in the culture of the school that can either have vitalizing or demoralizing effects on the school as a social system (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Good & Brophy, 1986; Purkey & Smith, 1983; Ruter, Maughan, Mortimore, Ouston, & Smith, 1979). Effective administrator can increase the self-efficacy of staff and teachers throughout the organization and increase the efficiency of school organization to facilitate learning in students.

Ineffective administrators can create a collective climate of low self-efficacy and academic powerless and futility detrimental to the teaching-learning process systemwide.

Bandura (1993) and his colleagues have been doing research on how collective school efficacy is related to school achievement where schools are the unit of analysis. Two approaches were used: (a) teachers' beliefs in their instructional efficacy to facilitate academic learning in their own classrooms are summed for a given school; (b) teachers' beliefs in their schools' capabilities as a whole are summed. The teachers' perceived collective efficacy to facilitate mathematical and reading achievement varied dramatically across Kindergarten through Grade 6. Perceived efficacy started out low in the early grades (K-1), perhaps because academic demands are low and the children are unprepared for classroom instruction. Perceived efficacy peaked at grade 2, decreased and remained stable through grades 3-5, and then dramatically plummeted at grade 6. In these early grades children are becoming socialized to the culture of the school and because academic demands are still not very rigorous, teachers believe that their schools have a good chance to facilitate the education of their students. In the upper grades, when academic demands become more rigorous and student deficits become increasingly apparent, teachers may perceive their schools as less likely to educate their students and perceived collective efficacy dramatically drops. This demoralizing decline in their schools instructional efficacy takes on increased significance from evidence that the teachers' perceived self-efficacy affects how well students deal with school transitions (Midgley, Feldlaufer, & Eccles, 1989). Students who are taught by teachers with a diminished perceived instructional self-efficacy, suffer loses in their own perceived self-efficacy and performance expectations in the transition from elementary grades to junior high school.

Bandura (1993) and his colleagues analyzed the casual relations among several variables as they related to Perceived Collective Efficacy and to Reading and Mathematics Academic Achievement. Student Body Composition was directly related to Prior Academic Achievement which was directly related to Collective Efficacy which was directly related to End of Year Academic Achievement. Teaching Longevity was directly related to Prior Academic Achievement and to End of Year Academic Achievement, but was directly negatively related to Collective Efficacy. Socioeconomic Status (SES)

and Student Body Stability was directly negatively related to Prior Academic Achievement, to Collective Efficacy, and to End of Year Academic Achievement. Prior Academic Achievement was directly related to End of Year Academic Achievement. Adverse characteristics of student body characteristics erode the schools' sense of instructional efficacy, such that the higher the proportion of students from low SES backgrounds and the higher the student turnover and absenteeism, the weaker the teachers' beliefs in their instructional efficacy to educate their students, and the lower the students' academic achievement. Student body characteristics reflecting low racial composition and ethnic diversity are weakly linked to schools' prior achievements but have no direct effects on the schools' collective sense of efficacy or on subsequent achievements. Longevity in teaching represents the total number of years teaching, years teaching in the same school and same grade, and the number of different grades taught. Teaching Longevity has a small positive effect on school achievement but a strong negative effect on the schools' sense of Collective Instructional Efficacy. The teachers' collective sense of instructional efficacy contributes heavily to their schools' level of academic achievement. Adverse student body characteristics influence the schools' academic achievements more strongly by altering the teachers' beliefs about their collective efficacy to motivate and educate their students than through direct effects on school achievement. Teachers who strongly believe that their students are motivatable and teachable whatever their background in schools saturated with low SES minority students achieve at the highest percentile ranks based on national norms of language and mathematical achievements.

Many efforts to increase the effectiveness of the schools are aimed at establishing or reestablishing the linkages among the home, the school, and the larger community. Hoover-Dempsey, Bassler, and Brissie (in press) found that self-efficacious parents regard education as a shared responsibility. The higher their sense of efficacy to instruct their children, the more they guided their children's learning and participated actively in the life of the school. Parents who doubted their efficacy to help their children learn turn over their children's education entirely to teachers. Hoover-Dempsey, Bassler, and Brissie (1987) also found that the teachers' sense of efficacy partly determined the level of parental participation in their children's academic life. Self-efficacious teachers increased parents' ability to help their children learn. The resultant scholastic progress and parental support of school activities,

in turn, raised the teachers' sense of instructional efficacy. Because of the centrality of familial influences on children's academic success, the contribution of perceived efficacy to parental involvement in educational activities is critical.

Bandura's (1993) expanded model can be summarized as follows. Individuals who have a low sense of personal efficacy in a given domain avoid difficult tasks, which are perceived as threatening. These individuals have both low aspirations and weak commitment to the goals they wish to undertake. They have a "self-diagnostic focus" rather than concentrating on how to perform the task successfully. Individual when confronted with difficult tasks, dwell on their personal deficiencies, on the obstacles, and on all sorts of adverse outcomes. These individuals are very slow to recover their sense of efficacy following failure. Because they perceive insufficient performance as deficient intellectual competence, it does not require much failure for them to lose faith in their capabilities. They are overly sensitive to stress and depression.

A strong sense of efficacy enhances personal accomplishments in many ways. Individuals with high self efficacy approach difficult tasks as challenges to be mastered rather than as threats to be avoided and a strong sense of intrinsic motivation and task engagement. These individuals seek out challenging tasks and maintain strong commitment to them. They maintain a "task-diagnostic focus" that guides effective performance. These individuals heighten and sustain their efforts under failure. They attribute failure to insufficient effort or deficient knowledge and skills that are acquirable. They quickly recover their sense of efficacy after failures. They approach threatening situations with assurance that they can control them. Their sense of personal efficacy results in feelings of personal accomplishments, reduces stresses, and lowers vulnerability to depression.

Self-efficacy beliefs are a product of a complex process of self-persuasion that relies on the cognitive processing of diverse sources of efficacy information conveyed enactively, vicariously, socially, and physiologically (Bandura, 1986). Once established, these self efficacy-beliefs contribute significantly to the quality and level of successful and optimal human functioning.

The extension of the study of personal agency and the establishment of perceived self-efficacy to mentally retarded populations and preschool children may clarify our understanding of the operation

of intrinsic and extrinsic motivation within a framework that has been very successful in understanding self-regulation of behavior in older and more normative populations.

C. Autonomy and Self-Determination

Decharms (1976, 1984), Deci and his colleagues (Deci, 1975; Deci & Ryan, 1985, 1991; Ryan & Connell, 1989; Ryan, Connell, & Deci, 1985), and Leeper and his colleagues (Leeper & Hodell, 1989), believe individuals have an inborn need to feel self-determining (i.e., to engage in activities by their own volition and endorsed by ones' sense of self, rather than to achieve some external reward or to avoid some external punishment or be controlled by intrapsychic forces such as guilt, or a sense of obligation). Individuals are intrinsically motivated when they perceive themselves as the cause of their own behavior (i.e., as possessing personal causation, having an internal locus of causality, having a feeling of choice), where they can experience themselves as casual agents and to view themselves as the originators of their own behaviors rather than pawns to external forces (DeCharms, 1968, 1976, 1984). Additionally, intrinsically motivated individuals have strong needs for a sense of competence, self-determination and challenge (Deci, 1975; Deci & Chandler, 1986; Deci & Ryan, 1985; Deci, Vallerand, Pelletier, & Ryan, 1991). Individuals are extrinsically motivated when they believe they are engaging in behavior because of controlling external environmental demand conditions (e.g., external reinforcers, external constraints, and pleasing another person), (ie., having an external locus of causality).

Many factors affect the perceived locus of causality, including the level of control exerted by others and the availability of rewards. Thus, someone who chooses to engage in an activity and is not rewarded for doing so is more likely to have an internal locus of causality than someone who is required or forced to engage in the activity for external reinforcement. Despite the important effects of these and other variables, it is an individual's perception of causality that is more important than any objective index of causality.

The facilitation of learning which is intrinsically motivating and free from externally-controlling teacher practices and extrinsic motivational control ideally should be the primary goal of American education for both handicapped and nonhandicapped students. However, since students show large

individual differences in the degree to which they are intrinsically or extrinsically motivated, these internal self-system characteristics need to be considered and educational practices matched to the particular motivational orientation of each student, at least in the short term to encourage optimal learning. The author believes, however, that in the future educational techniques will be needed to change more extrinsically motivated students into extrinsically motivated ones.

I will review some of the research concerning the demand characteristics of classroom environments known to influence student intrinsic motivation (e.g., rewards and punishments, and teacher attitudes and behavior) and the implications of this research for educational programming for mildly mentally retarded students. Deci and Ryan (1985) conceptualize these demand characteristics of the classroom environment as "informational" or "controlling". The "informational" classroom environment conveys relevant information to the student about the student's competence at a task, thus supporting self-autonomy and intrinsic motivation in the learner. The "controlling" classroom environment is designed to bring about a particular behavioral outcome in the student, thus supporting dependency and extrinsic motivation in the learner. Jackson (1968) has spoken about the hidden curriculum of social control and classroom management which permeates our schools.

Leeper (1981), Deci (1975), and Bandura (1982) all distinguish between two functions of extrinsic rewards in classrooms: (a) as an incentive to control behavior (Leeper & Hodell's (1989) instrumentality function of reward, Deci & Ryan's performance-contingent rewards), and (b) as providing information about task mastery (Leeper & Hodell's (1989) evaluative function of reward, Deci & Ryan's task-contingent reward). Lepper & Hodell (1989) distinguish a third function of extrinsic reward: (c) the function of social-control or constraint where rewards provide information concerning the degree of extrinsic constraint over one's engagement in the activity.

Rewards used to control behavior (task-contingent rewards, Deci and Ryan, 1985) shift students away from a perception of autonomy and personal causation and toward a perception of external causation which undermines intrinsic motivation. Leeper & Hodell (1989) view this instrumental function of reward as providing information concerning the likely social and tangible consequences of subsequent task engagement which effect the expectations concerning the probability of further tangible

extrinsic rewards or social approval in subsequent situations with the result that there will be a subsequent increase in extrinsic motivation in settings viewed as functionally similar. Rewards used to provide information (performance-contingent rewards, Deci and Ryan, 1985) vary in their effect, depending on whether the information is interpreted as supporting the competence of the learner ("informational) or as suggesting incompetence ("controlling). Leeper and Hodell (1989) view the evaluative function of reward as providing information concerning one's degree of success (or failure) at the activity which effect one's perceptions of personal competence (or incompetence) at the activity and one's expectations regarding the likelihood of success or failure at the task. Through this evaluative process, extrinsic rewards that lead to increases in the student's perceptions of their own competence and self-efficacy at the rewarded activity are expected to increase student's subsequent intrinsic motivation toward the previously rewarded activity in the future, whether or not additional extrinsic rewards are expected. Conversely, extrinsic incentive systems that serve to lower students' perceptions of competence and self-efficacy may decrease the subsequent intrinsic motivational appeal of the activity. Leeper and Hodell (1989) view the social-controlling function of extrinsic reward as involving the student's reasons for engaging in particular activities (Leeper, Sagotsky, Dafoe, & Greene, 1982) and as effecting the perception of one's activity as "work" or "play", as extrinsically constrained or instrumentally controlled rather than intrinsically motivated. Such decreases in later intrinsic motivation, will necessarily run counter to any increases in extrinsic motivation that may be produced by reward systems that lead children to believe that further engagement in a previously rewarded activity will continue to produce further tangible rewards. Such decreases may also stand in opposition to any positive effects the reward system may have had on students' perception of their own competence at the activity. Thus, predicting the effects of a given reward procedure on student's later motivation may require attention to each of these three conceptually independent processes (e.g., instrumentality, evaluation, social control).

Many educators and psychologists have warned against an overreliance on extrinsic rewards for motivating children to learn (Torgesen, 1986). Under certain conditions, offering extrinsic rewards for engaging in tasks can undermine intrinsic interest in a task (Deci & Ryan, 1985; Leeper & Hodell, 1989;

Morgan, 1984; Ryan, Connell, & Deci, 1985). Learning motivated by intrinsically motivated learning supported by informational classroom environmental strategies is superior to extrinsically motivated learning (Bry & Witte, 1982; Connell & Ryan, 1984; Greene, Sternberg, & Leeper, 1976). Learning and thinking in children is enhanced by freeing them from externally controlling rewards and punishments. When children are learning intrinsically, they interpret their successes and failures as informational feedback rather than as rewards and punishments (Bruner, 1962).

The epitomy of controlling classroom environmental educational strategies to motivate learning is the use of extrinsic token reinforcement programs (O'Leary & Drabman, 1971). Token reinforcement programs have been quite effective in promoting appropriate social and on-task behavior in behaviorally disordered students. Improvements in academic learning are less frequent. Extrinsic token reinforcement programs have not been useful in facilitating flexible, conceptual thinking in students through the development of their self-directed exploration and curiosity. Greene et al. (1976) reported that rewarded math activity in junior high school aged nonhandicapped children increased in high and low interest math activities students. However, following the removal of the token program, all students showed a decline in math activities relative to a control group. Token-reinforcement programs may be perceived as much too controlling by students and thus will not promote self-regulation in the students.

Implicit in these findings is an awareness that utilization of evaluative feedback through reward and punishment needs to be carefully scrutinized in all classrooms. There are many regular classroom procedures that involve the use of extrinsic feedback, although less structured than token economies found in special education settings. One must raise questions regarding the exclusive use of such incentives as grades, gold stars, praise from teachers and related procedures involving the rewarding of behavior that the teacher wants. Even though these procedures are effective in producing desirable behavior sought by the teacher, it is likely that such rewarded behaviors will not become internalized by the students or become self-determined or self-regulated.

The misuse of powerful extrinsic reinforcers and sanctions have unwittingly undermined students'intrinsic motivation. There are "hidden costs" of overreliance on extrinsic rewards and

punishments to motivate and control student's behavior (Leeper & Greene, 1978). There are three "classic" demonstrations.

Deci (1971) compared the subsequent responses of college students who had been offered money to work with a geometric puzzle of high initial intrinsic interest with those who had played with the same puzzle without pay. In a subsequent session involving no extrinsic rewards, Deci found that previously rewarded subjects chose to spend less time playing with the puzzle than did previously nonrewarded subjects. Kruglanski, Friedman, and Zeevi (1971) offered half of a sample of Israeli high-school students a personal tour of a nearby university facility in exchange for their engagement in a series of experimental tasks. Compared to other students who had undertaken these same activities without the promise of any extrinsic reward, rewarded students reported more negative attitudes toward the experimental tasks. Leeper, Greene, and Nisbett (1973) worked with preschool children selected on the basis of their initial high intrinsic interest in a particular art activity in their class. These children were then asked to engage in this same art activity in a different setting, under one of three conditions. Some were offered the chance to win an attractive tangible award for engaging in this activity; others were offered no such award, although half of these other children did receive the same award unexpectedly. Three weeks later, in their classrooms where awards were no longer present, children who had previously agreed to engage in the target activity in order to receive an award showed significantly decreased interest and a poorer quality of artistic creativity, compared both to their own baseline levels of interest and to the levels of postexperimental interest shown by children who had received no award or an unexpected award.

Extrinsic rewards appear to have detrimental effects on intrinsic motivation, when initial interest is high, when extrinsic constraints are superfluous and salient, and when they provide a "bribe" for one's engagement in the activity (Leeper & Hodell, 1989). Leeper (1981) found that unnecessarily powerful extrinsic rewards, functionally superfluous temporal deadlines, and excessive adult surveillance all can be shown to have negative effects on children's later intrinsic interest in the activity. The detrimental effects on intrinsic motivation are less likely to occur when extrinsic rewards are seen as "bonuses" rather than "bribes", when external reinforcers convey to the children information about

their high competence and ability at an activity, and the external reinforcers have some real, integral relationship to the task rather than an arbitrary artificial one. There is very little research that has shown the extrinsic rewards can increase intrinsic motivation when it all ready exists in an individual, however the initial use of extrinsic reinforcers may be important in enhancing interest in a task when the levels of intrinsic motivation in an individual are very low (Leeper & Hodell, 1989).

Research on intrinsic motivation (Deci et al., 1991) has consistently found that when external reinforcers are operative they do indeed control behavior, however they also undermine intrinsic motivation for interesting tasks and to impede the internalization of regulations for uninteresting tasks (Deci, Eghrari, Patrick, & Leone, 1991). When performance evaluation feed-back in school settings is made highly salient it will undermine intrinsic motivation (Smith, 1974), conceptual learning (Benware & Deci, 1984), and creativity (Amabile, 1979). Other controlling environmental demand conditions such as deadlines (Amabile, Dejong, & Leeper, 1976), imposed goals (Mossholder, 1980), and competition (Deci, Betley, Kahle, Abrams, & Porac, 1981; Vallerand, Gauvin, & Halliwell, 1986; Vallerand, Hamel, & Daoust, 1991) have all been found to decrease intrinsic motivation. Each of these studies have forced and externally controlled individuals to think, feel, or behave in a way that they are aware that they are being externally controlled, resulting in a diminishment of the individuals' sense of autonomy, and creating an externally perceived locus of causality and a decrease in their inner sense of intrinsic motivation. Educational practices that foster an ego-orientation, concerns about demonstrating competence can also undermine feelings of self-determination and decrease intrinsic motivation. Ryan (1982) informed subjects that their performance on a task reflected creative intelligence (enhancing their ego-involvement). Such subjects showed less subsequent intrinsic motivation than task-involved subjects who were not told about the task's relationship to intelligence. Ryan (1982) views ego-involvement as a type of internal control (ie., feelings that it is necessary to do well to prove one's self-worth) that undermines intrinsic motivation in the same way as external environmental demand conditions. Rewards made contingent upon a specific level of performance providing information about levels of mastery are less likely than task-contingent rewards to undermine interest, and may even enhance it (Rosenfield, Folger, & Adelman, 1980). The competence feedback implicit in social

reinforcement is presumably why external praise does not reduce intrinsic motivation (Arkes, 1978). The exception is when the controlling function of social praise is overemphasized. The only problem with performance-contingent rewards is that they only maintain or enhance intrinsic motivation if the feedback is positive. Rosenfield et al.(1980) have shown that performance-contingent rewards enhance intrinsic motivation when they signal high competence to the learner, but not when they signal low competence which undermines intrinsic motivation. The effects of external reinforcement on performance depend on students' perceptions. External rewards decrease intrinsic motivation if they are perceived to be "controlling". If external rewards are perceived to be "autonomous or informational" such that they boost the competence of the learner, they may increase intrinsic motivation. This effect of extrinsic reinforcement on intrinsic motivation may be explained in terms of the "discounting principle" (Leeper & Greene, 1978). According to discounting principle, if one possible explanation for an individual's behavior is salient all other explanations will be "discounted". An external reward for performing an activity is usually more salient than intrinsic reasons for performing the activity. Thus, an individual may originally perceive intrinsic interest as the reason for doing a task, but if a desired extrinsic reward for the behavior is offered, intrinsic interest is discounted and the more salient extrinsic reward is perceived to be the cause.

Deci and Ryan (1985, 1991) account for the effects of extrinsic reinforcement on intrinsic motivation in terms of a theory of cognitive evaluation and self-determination. Rewards cause individuals to shift from an internal to an external locus of causality such that rewards create a feeling of being controlled and interfere with a feeling of self-determination. Thus intrinsic motivation is proportional to the degree to which individuals perceive their behavior as self-determined or volitional, rather than controlled by others, by rewards, or by intrapsychic forces, such as guilt, or a sense of obligation (Deci, Vallerand, Pelletier, & Ryan, 1991).

Deci et al. (1991) have suggested that there are different types of extrinsically motivated behaviors and that these types differ in the extent to which they represent self-determined vs controlled responding. Deci and Ryan (1985) have proposed that individuals engage in academic behaviors that are not intrinsically interesting and for which they are not positively reinforced because they have

internalized achievement values. Internalization which is viewed as a motivated proactive process through which individuals transform regulation by external contingencies into regulation by internal self-system processes. They believe that individuals are inherently motivated to internalize and integrate within themselves the regulation of uninteresting activities that are useful for effective functioning in the social world; and the extent to which the process of internalization and integration proceeds effectively is a function of the social context. Their theory of self-determination (Deci & Ryan, 1985; Deci et al., 1991; Ryan, 1991) has identified an autonomous continuum of four types of extrinsic motivation (e.g., external regulation, introjected regulation, identified regulation, and integrated regulation) related to how successfully an optimal self-regulatory style of intrinsic motivation has been internalized and integrated into the self. At one end of the continuum are externally controlled behaviors, external regulation (rule following; avoidance of punishment) and at the other end of the continuum are intrinsically motivated behaviors, integrated regulation, (enjoyment, fun). In the middle of the continuum are behaviors that were originally externally regulated by extrinsic controls but became transformed to be experienced as self-determined and self-regulated (introjected regulation: self and other-approval; avoidance of disapproval; and identified regulation: self-valued goal; personal importance).

External regulation refers to behaviors for which the locus of initiation is external to the person, (e.g., external reward or the threat of punishment). A student who performs a task for these contingencies is externally regulated because the task is performed because of an external contingency, and these contingencies are considered the loci of initiation and regulation. External regulation represents the least self-determined form of extrinsic motivation.

Introjected regulation is based on a type of internalized regulation which is not fully integrated into the self-system, and thus is not considered fully self-determined. Such regulation involves internalized rules or demands that pressure one to behave and are supported with threatened sanctions (e.g., guilt) or promised rewards. The individual has not yet fully identified with the regulation because behavior results from alien internal coercion. Introjected regulation is more like external regulation than genuine self- determined forms of regulation because it involves coercion and not true choice for the individual.

Identified regulation occurs when the individual has come to value the behavior and has identified with and accepted the regulatory process which has become more fully a part of the self-system. Behaviors thus regulated are considered more autonomous or self-determined than are behaviors regulated by external contingencies or introjected rules or demands, because identification allows the individual to experience a sense of choice concerning their behavior. An example would be a student who seeks out additional academic work because the task is perceived as important and self-valued. The motivation is extrinsic because the activity is performed primarily because of its usefulness or instrumentality for the goal of improving academic performance and succeeding in future endeavors, rather for its intrinsic interest. The behavior is considered relatively self-determined because the student does it willingly for personal reasons, rather than under external pressure.

Integrated regulation is the most developmentally advanced form of extrinsic motivation because the regulatory process is fully integrated into the self-system (i.e., the identifications are reciprocally assimilated with the individual's other values, needs, and identities). When the regulatory processes are integrated, behavior is an expression of who the individual is, of what is valued by, and what is important to the individual. Behaviors regulated by integrated processes are fully self-determined and appear primarily in adult stages of development. Deci et al. (1991) view integrated regulation as different from intrinsic motivation, though both are forms of autonomous self-regulation. The behavior associated with true intrinsic motivation (e.g., behaving willingly, being creative, and displaying conceptual or intuitive understanding) can be used as objective markers of the extent to which an extrinsic regulation has become fully integrated into the self-system. Intrinsic motivation is characterized by interest in the activity for its own sake, whereas integrated integration is characterized by the activity being personally important for a valued outcome.

Deci and his colleagues have recently constructed questionnaires to assess regulatory styles (Ryan & Connell, 1989; Vallerand, Blais, Brier, & Pelletier, 1989). Ryan & Connell (1989) designed the Academic-Self-Regulation Questionnaire (ASRQ) for students in the late elementary and middle schools. It includes four subscales measuring the external, introjected, and identified forms of extrinsic motivation, and also intrinsic motivation. It focuses on students' motivation to do school-related activities

and asks them to endorse the degree to which various reasons are true. Integration was not included in the ASRQ because it was assumed these students were too young to have achieved a sense of integration with respect to these activities. The scale presents a stem followed by several reasons, for example "I do my homework because": "I'll get in trouble if I don't" (external); "I'll feel bad about myself if I don't do it" (introjected); "It's important to me to do my homework" (identified); and "I enjoy doing my homework" (intrinsic). Vallerand et al. (1989) designed the Academic Motivation Scale (AMS) for college students. The AMS also assesses external, introjected, identified regulation and intrinsic motivation, but also measures amotivation. The AMS uses a formate similar to the one used in the ASRQ.

One of the most important elements for promoting intrinsically motivated learning in students is the approach of the teacher. Whether teachers extinguish or nurture intrinsic motivation for learning depends on how rewards and punishments are used: as controlling or as informational feedback. Deci, Nezlek, and Scheinman (1981), and Deci, Schwartz, Scheinman, and Ryan (1981) report that fourth-through sixth grade teachers who believe in dealing with children in a way that encourages them to be autonomous, to use rewards informationally, tend to facilitate intrinsic motivation and self-determination in their students; whereas teachers who are controlling tend to discourage the intrinsic motivation and self-determination of their pupils. Deci describes the controlling classroom approach as involving the teacher mandating what the child must or should do; sanctions are used to insure that tasks are completed. Informational classroom styles are described as supporting autonomy where the teacher encourages a self-determined competence by asking the students to compare their behavior with others and by encouraging students to arrive at a problem solution that seems right for themselves.

Vallerand and his colleagues have shown that students who had a more self-determined form of motivation were more likely to stay in school than students who had less self-determined motivation (Daoust, Vallerand, & Blais, 1988; Vallerand, 1991; Vallerand & Bissonnette, in press). Intrinsic motivation and autonomous forms of extrinsic motivation are strongly linked to positive academic performance (Gottfried, 1985, 1990; Grolnick & Ryan, 1987; Grolnick, Ryan, & Deci, in press; Lloyd & Barenblatt, 1984; Pintrich & De Groot, 1990).

Whether students attribute successful learning as being determined by teacher behavior or their own personal behavior is respectively a by-product of either a controlled classroom teacher approach or an informational classroom teacher approach. Ames (1984) showed that how teachers structure the classroom environment affects the attributions for success and failure that students make. It was demonstrated that whether the goal structures were cooperative, competitive, or individualistic, all of them influenced the standards students chose to use for self-evaluation. Attributions that students make about their intellectual competence, effort, and strategies for attaining goals are affected by what type of classroom goal structures are established by the teacher.

Matheny and Edwards (1974) assessed the effects of increasing student choice and responsibility for learning in grades one through seven. Teachers were trained to give students flexibility and responsibility for determining when they completed assignments; to allow students to score their own written work and to use individual conferences with teachers to evaluate student progress; to contract with students for long-range assignments; and to set up independent learning centers for students. Student's perceptions of their control over academic activities increased most in classes where the teachers fully used these curricular methods. Teachers who were most successful in implementing these methods had the highest number of students who gained the most in reading achievement.

Pascarella and Pflaum (1981) investigated the effects of a remedial intervention program on the reading achievement of poor readers with different levels of internal attribution. Learning disabled and slow developing readers were assigned to reading instructional programs differing only in the extent of pupil control over determination of errors (teacher determined or pupil determined). Students with low pretreatment levels of internal attributions benefited more in reading achievement from the teacher-controlled classroom environment. Students with high pretreatment levels of internal attributions benefited more in reading achievement from autonomous-student controlled classroom environments. This study strongly supports the importance of matching student motivational orientation to the task-demands and reward structures of the classroom setting.

Grolnick and Ryan (1987) have asserted that each step from extrinsic control toward integrated self-regulation will be accompanied by improvements in the quality of learning. Fifth grade children were asked to read an age appropriate passage under one of three conditions: children in one group were given an extrinsic prompt, a grade; children in the second group were given an intrinsic prompt, for the sake of learning; and the third group was given no prompt. Results indicated that children given an intentional learning prompt, whether intrinsic or extrinsic, evidenced higher rote recall than those students who had not been prompted with a learning set. However, extrinsic children were inferior to either of the other groups on conceptual learning. It was concluded that while extrinsic reinforcement did not interfere with the memorization of facts, it did interfere with their grasping the meaning of the read passage.

The benefits of greater student autonomy have also been demonstrated at the high-school level. Rainey (1965) showed that high-school science students who were encouraged to organize their own experiments showed more care and involvement in lab work than those who were given detailed instructions and directions. Similarly, Pascarella, Walberg, Junker, and Haertel (1981) found that in science classrooms where students had relatively greater control over the learning situation, the students demonstrated more interest in science.

Interestingly, Ryan and Grolnick (1986) showed that there are large individual differences in upper-elementary-grade students'perceptions of their classroom environment in terms of being "origins" (perceptions of being responsible, instrumental, and possessing an internal locus of causality), versus being "pawns" (perceptions of having little sense of personal causation). These individual differences in children's perceptions of control were associated with the children's perceptions of competence and global self-worth with "pawn"s having lower levels of competence and global self-worth than "origins".

Self-determined motivation has been strongly linked to educational outcomes across the life span, from early elementary school to college age. Evidence strongly indicates that when classroom learning experiences are created that facilitate intrinsic motivation, students' learning, particularly conceptual and creative thinking, increases dramatically relative to that of students in settings that nurture extrinsically motivated learning.

Teacher Behavior Toward the Mildly Mentally Retarded Student: The Reinforcement of Extrinsic Motivation in the Classroom

Mildly mentally retarded children reportedly are less intrinsically motivated than their non-handicapped peers (Haywood & Switzky, 1985, 1991; Switzky & Haywood, 1984, 1991; Switzky & Heal, 1990; Switzky & Schultz, 1988). This characteristic motivational orientation of children with mental retardation very often encourages the use of "controlled" instructional approaches (i.e., token economies and other externally reinforcing incentives) that shape student behavior to externally defined behavioral goals. It is widely believed that this type of classroom approach creates a structural environment in which children with mental retardation can more easily learn. In the light of the documented evidence that shows how an extrinsic motivational orientation toward learning further intensifies learning deficits (leading to even greater performance deficits in conceptual learning and long term retention), traditional classroom approaches to mildly mentally retarded youngsters need to be examined.

If as motivational researchers (Deci & Ryan, 1985, 1991; Dweck & Leggett, 1988; Feuerstein et al., 1991; Harter, 1987; Hodapp et al., 1990; Leeper & Hodell, 1989; Nicholls, 1989) suggest: the developmental pathways leading to an extrinsic orientation toward learning consist of experiences that discourage intrinsically motivated self-regulatory behavior; then, it is a questionable practice to continue to utilize a classroom teaching model that further reinforces and maintains this extrinsic orientation in mildly mentally retarded youngsters. An externally controlling teacher approach, interacting with an extrinsically regulated student, neither facilitates the development of an intrinsic orientation to learning, nor does it promote the conceptualization and long term retention of learned material (Ames & Archer, 1988; Deci & Ryan, 1985, 1991; Grolnick & Ryan, 1987; Lloyd & Barenblatt, 1984; Meece et al., 1988; Nolen, 1988; Pintrich & Schrauben, 1992). Paradoxically, in the instance where the student with mental retardation may be self-regulating and intrinsically motivated to learn, "controlling" teacher styles may inhibit the academic growth of the handicapped student.

Implications for the Individual Educational Programming of Students with Mild Mental Retardation

What are the instructional considerations for the mildly mentally retarded student taking into consideration teachers' behavior and students' motivational orientations? Classroom environments that cultivate learning exclusively through controlling feedback mechanisms that manipulate the learning process through extrinsic behavioral contingencies are insufficient in the long term of promoting creativity and growth in the students. Incorporated into the classroom must be some provision to promote self-regulation and the development of an intrinsic orientation toward the learning process.

The implementation of this approach must take into consideration the individual characteristics of each student, and the matching of the motivational orientation of the pupil to the task demand and reward structure of the classroom, at least initially. It makes little sense to rigidly promote self-regulatory behavior in a student grossly lacking in these qualities; just as it does not seem wise to dogmatically regulate the student's behavior with operant contingencies, when the child is already intrinsically involved in the learning process.

It is to be expected that the typical student with mild mental retardation will at first require a more controlling teaching approach in order to be appropriately engaged in the classroom curriculum. At the same time it should not be construed that the external teacher control of the classroom is the ultimate long range objective of any individualized educational program. The teacher most programmatically attempt to move beyond relying on punishment and reward formats that have become, in and of themselves, the primary incentives for the student's involvement in the learning process and move on to more autonomous classroom environments.

Research Implications for Students With Mild Mental Retardation

Many classroom special educators are very aware that exclusive use of operant technologies(e.g., token economies) with students with mental retardation has not led to the desired educational outcomes they seek (self-regulation, intrinsic motivation, mastery learning, and conceptual problem solving). In the short term, these contingency management systems have enabled the teacher to "get control" of aberrant student behavior, while at the same time they have enabled the teacher to implement an academic curriculum that solicits involvement through the contingent use of reward and

punishment. In the long term, these controlling styles may inadvertently prevent students from ever developing or maintaining the essential behavior that are necessary for successful adaptation to a mainstream educational environment that values self-regulation of social behavior, intrinsic motivation toward mastery learning, and the ability to conceptually and creatively problem solve.

It can also be argued that few realistic solutions have been forthcoming that offer relief to teachers faced with student academic dysfunction that is confounded by low motivation for self-directed mastery learning. Much of the applied research on the personality dimension of intrinsic motivation has focused on the learning and performance of non-handicapped school populations. The investigative work that has been dome with mentally retarded students has for the most part been confined to laboratory settings or settings lacking external validity examining the effects of intrinsic\extrinsic motivation on learning tasks that have marginal application to academic or real-world settings.

Important questions need to be answered regarding the development of personality dimensions that shape the approach mentally retarded students take toward learning in the classroom, in the community, and on the job. There have been few attempts to discover how intrinsic motivation develops in mentally retarded persons, (the author after 23 years of research is still amazed that it develops at all in mentally retarded individuals); or perhaps more importantly, how is it possible to convert the typically extrinsically oriented mentally retarded person into an intrinsically motivated person.

It is reasonable to assume that the developmental pathways that lead to a self-regulated, intrinsic orientation consist of positive reinforcement, modelling, and approval by parents and teachers for independent mastery attempts ((Deci & Ryan, 1985, 1991; Dweck & Leggett, 1988; Feuerstein et al., 1991; Harter, 1987; Haywood & Switzky, 1985, 1991; Hodapp et al., 1990; Leeper & Hodell, 1989; Nicholls, 1989; Switzky & Haywood, 1984, 1991; Switzky & Heal, 1990; Switzky & Schultz, 1988). Therefore, it is important to determine whether programmed long-term exposure to an "informational" and autonomous-supporting classroom can change an extrinsically motivated mentally retarded student into an intrinsically motivated learner, and even more importantly, whether this motivational transition will lead to improved academic performance. Of critical relevance is the reported finding that short-term exposure to an informational-autonomous environment for mildly mentally retarded learners (having an

already established extrinsic motivational orientation) will be detrimental to their learning and performance (Haywood & Switzky, 1985, 1986, 1992; Schultz & Switzky, 1990; Switzky & Haywood, 1984, 1991; Switzky & Heal, 1990; Switzky & Schultz, 1988).

Because it is unclear exactly what goes on between teachers and mildly handicapped learners, specific teacher behaviors need to be evaluated in relationship to their effect on individual learning in the student. Deci et al., (1981) have developed an instrument to measure teacher orientation toward control vs. autonomy which has been validated, to some extent , with nonhandicapped children and may be valuable in measuring the effect these teacher behaviors have on mildly mentally retarded learners. If special educators are concerned with imparting knowledge in ways other than through the traditional rote learning exercises, then indeed, externally controlling teaching styles may be inadequate to the task.

Therefore, further investigation into the effects of teacher informational style on motivational orientation and learning and the performance of mildly mentally retarded students in the classroom is very essential. This research will provide practical and applied guidelines for individual educational programming in classrooms serving mildly mentally retarded students. It is apparent that student motivational orientation is integral to learning in both handicapped and non-handicapped populations with the strong interacting influence of teacher instructional behavior having a significant effect on learning and performance. The critical examination of this relationship is crucial in understanding how to maximize academic performance in mildly mentally retarded learners, as well as identifying appropriate and effective educational strategies for teaching this diverse student population.

D. Intrinsic Motivation and Cognitive Processes

Even those persons who enter the world predestined to have the highest endowment of native fluid intelligence must learn a set of fundamental cognitive functions in order to have ready access to their intelligence and to behave in a consistently intelligent ways (Feuerstein, Klein, & Tannenbaum, 1991; Hamers, Sijtsma, & Ruijssenaars,1993; Haywood & Switzky, 1986; Haywood & Tzuriel, 1992; Vye, Delclos, Burns, & Bransford, 1988). These cognitive functions include learned information processing components of intelligence, the internal or mental processes that underlie intelligent

behavior: metacomponents, performance components, and knowledge acquisition components (Bransford & Stein, 1988; Brown, 1978; Borkowski, Carr, & Pressley, 1987 Borkowski, Johnson, & Reid, 1987; Pressley, Borkowski & O'Sullivan, 1985; Pressley, Borkowski, & Schneider, 1987; Sternberg, 1987).

Metacomponents are the executive processes that coordinate, plan, monitor, and evaluate procedures used to solve problems. Examples of metacomponents include defining the problem, selecting mental representations, selecting strategies, monitoring solutions, and allocating attentional and other mental resources.

Performance components implement the plans that metacomponents formulate. These include inferring relations among stimuli in terms of their similarities and differences, applying previously inferred relations to new situations, mapping higher-order relationships among stimuli, and comparing attributes to stimuli.

Knowledge acquisition components are processes that enable one to learn new information. These are strategies that learners use to identify important information and to combine and compare new information with existing knowledge so as to increase and determine meaning. Processes used to determine meaning may include selective encodings or locating relevant new information, selective combinations, combining this relevant new information into meaningful wholes, and selective comparisons, interrelating information with what is already known as to maximize the connectedness of the newly formed knowledge structures to the previously formed knowledge structures. In addition, knowledge acquisition components include instructing the learner to meaningful contextual cues.

Other components of cognitive processes that must be taught include experiential components of cognitive functioning for coping with novelty, and automatization of information processing components. The metacomponents. performance components, and knowledge acquisition components of information processing do not operate in an experiential vacuum. On the contrary, they are applied to tasks and in situations that vary in terms of their familiarity to the individual. Initially, tasks and situations may be quite novel. As the individual gains experience with tasks and situations, task performance may shift from being quite controlled to partially or fully automatic. Automatization frees mental resources for

coping with novelty. The teaching of thinking may be useful when the problems to which the processes are applied are relatively, not wholly novel. Other things being equal, individuals who are able to use and acquire insight from new information, and who are able to perform operations smoothly and without much conscious effort, are likely to be more successful in learning and in problem solving tasks than are those who do not have these abilities. Processes assumed to contribute to insightful acquisition of new knowledge are the three information processing knowledge acquisition processes of selective encoding, selective combination, and selective comparison.

The cognitive processing components of intelligence are operational, at varying levels of experience, in tasks of varying levels of contextual relevance to one's life. Behavior that occurs in highly relevant contexts is more pertinent to the use of cognitive processing components than is behavior that has no actual or even potential contextual relevance. Intelligent performance can only be meaningful in terms of the real-world context in which cognitive processes operate. Individuals must learn to manipulate the environment by adapting to the environment, by shaping or restructuring the environment, or by selecting new environments relevant to their own lives. Individuals usually attempt first to adapt to the environment in which they live. Adaptation consists of trying to achieve a good fit between oneself and the environment. If adaptation fails, due to a lack of congruence between one's interests, abilities, motives or values, than one must try to restructure the environment or select a new environment. Shaping involves an attempt to restructure one's environment to increase the fit between oneself and one's environment. If and when shaping fails, it is time to search for new environments that are more congruent with one's needs and values. Virtually all persons need to learn cognitive processes that will be relevant to these aspects of "practical intelligence". Cognitive development consists in large part of a process of successive discovery and applications of these understandings, processes, rules, and elementary logic systems. Exactly how cognitive functions are acquired, or why they fail to be acquired, is not completely clear, but it is highly likely that mediated teaching is an important contributor (Brown & Palinscar, 1987; Feuerstein, et al, 1991; Haywood & Switzky, 1992; Haywood & Tzuriel, 1992; Schultz & Switzky, 1990; Switzky & Schultz, 1988).

For the last thirty years, educators and psychologists have tried to understand why mentally retarded and other learning deficient children often failed to generalize a newly trained skill to new similar learning contexts (Borkowski & Cavanaugh, 1979). The basic paradigm was the use of strategy instruction which was viewed as being inefficient in these learning deficient students. Some positive effects were found following strategy instruction, but performance gains were ephemeral, and transient and were usually restricted to tasks similar to the ones trained on (near transfer but little far transfer). Even the development of metacognitively driven models of strategy generalization (Borkowski, Johnston & Reid, 1987; Pressley, Borkowski & O'Sullivan, 1985; Pressley, Borkowski & Schneider, 1990) which enhanced strategy generalization through: (a) providing repeated practice with instructed strategies, (b) using multiple problem types, (c) informing children why strategies are useful, (d) asking children to contrast their performance using different strategies, and (e) teaching self-control procedures (e.g., planning, monitoring, and checking); all techniques which stressed that strategies become integrated into a coherent metacognitive network guided by self-regulatory processes in order to become stable and generalizable, did not lead to dramatic generalization effects.

It became apparent that the efficient operation of cognitive processes and ability systems is vitally linked to motivational processes. Only when personal-motivational processes are included in strategy training interventions will strategy generalization become facilitated. Strategy-based actions directly influence the self-concept, attitudes about learning, and attributional beliefs about personal control. In turn, these personal-motivational states determine the course of new strategy acquisition and, more importantly, the likelihood of strategy transfer and the quality of self-understanding about the nature and function of mental processes. Most metacognitively based strategy training interventions have failed because researchers falsely assumed that students automatically found pleasure in using their problem-solving skills and ignored the student's cognitive and emotional perspectives about learning and the learning-task (Bandura, 1993; Borkowski & Kurtz, 1987; Borkowski, Johnston & Reid, 1987; Borkowski, Carr, Rellinger, & Pressley, 1990; Borkowski, Day, Saenz, Dietmeyer, Estrada, & Grotteluschen, 1992; Carr, Borkowski, & Maxwell, 1991; Day, Borkowski, Dietmeyer, Howsepian; & Saenx, 1992; Dweck, 1986; Haywood & Switzky, 1992; Maehr & Pintrich, 1991; McCombs & Marzano,

1990; Nicholls, 1989, 1990; Paris & Byrnes, 1989; Paris & Newman, 1990; Schiefele, 1991; Schunk, 1991; Sternberg, 1985; Wigfield & Karpathian, 1991).

Borkowski and his collaborators (Borkowski et al., 1992) have developed a new model of strategy-based intervention based on the ideas that interventions that enhance students' task involvement (Nicholls, 1989, 1990) or that promote the adoption of learning goals (Dweck, 1986) should result in greater generalization because they reduce comparisons between one's own performance and those of peers. Interventions that emphasize task involvement highlight the benefits rather than the liabilities associated with effortful achievement. Borkowski et al. (1992) realize that the students' definition of success (getting better vs being the best) and failure (making understandable mistakes vs being stupid) change under circumstances of task involvement, as do the students' attributions about the causes of success and failure (ability, effort, or appropriate strategy choice). Borkowski et al. (1992) stress that increased task involvement and/or the adoption of learning goals are associated with motivational growth (e.g., an internal locus of control, mastery-oriented attributional patterns, positive feelings of self-efficacy, greater intrinsic motivation) as well as metacognitive development (e.g., accurate performance predictions, good choice of strategies, active planning and monitoring). These personal-motivational factors energize the self-regulating executive skills necessary for strategy selection, implementation, and monitoring. Individual differences among learners in task performance, problem-solving, and strategy generalization are the result of deficiencies in the metacognitive system or the personal-motivational self-system, or in both systems.

Borkowski and his collaborators (Borkowski et al., 1986; Borkowski & Kurtz, 1987; Borkowski et al., 1990; Borkowski et al., 1992; Pressley et al., 1984, 1985) have conceptualized developmental patterns for the emergence of these information processing components of intelligence, which they call Specific Strategy Knowledge, Relational Strategy Knowledge, General Strategy Knowledge, and Metamemory Acquisition Procedures (MAPs), which are energized and controlled by personal-motivational factors.

Specific Strategy Knowledge, which accumulates slowly as children mature, is knowledge about identified and focused strategies such as rehearsal, organization, elaboration, and imagery, and their

application to a range of learning tasks. Specific Strategy Knowledge involves understanding (a) the goals that can be achieved through strategy use, (b) the tasks for which particular strategies are appropriate, (c) the strategies' range of applicability, (d) what learning gains to expect from consistent application of given strategies, (e) the amount of effort associated with strategy development, and (f) whether given strategies are enjoyable or burdensome to use (e.g., imagery has inherent interest value, whereas cumulative rehearsal requires hard work). The appearance of a strategy on a transfer test suggests that the learner possesses sufficient information about its attributes so that the new tasks is recognized as solvable through the application of one of several available strategies (Borkowski, 1985).

As specific knowledge about multiple strategies is acquired, two other information processing components emerge: Relational Strategy Knowledge and General Strategy Knowledge. Relational Strategy Knowledge provides children with classification systems that can be used to understand the comparative or relative merits associated with a number of specific strategies. General Strategy Knowledge reflects the understanding (a) that effort is required to apply strategies and that a strategic approach, although requiring effort, often results in more successful performance than do nonstrategic approaches, and (b) that understanding that rudimentary strategic plans should be made before trying to carry out a task, with the additional recognition that the plan may need to be modified as the task proceeds. These aspects of general strategy knowledge increase the likelihood that an individual will search for, modify, and apply appropriate strategies (Clifford, 1984). The operation of General Strategy Knowledge is driven by motivational processes such as intrinsic and extrinsic motivation, attributional beliefs, and self-efficacy. General Knowledge about the value of behaving strategically is derived from the internal self-system characteristics of children, which can operate either to compensate for deficient native intelligence and inadequate cognitive processes and abilities, and motivate children to confront challenging learning tasks, or to intensify deficiencies in native intelligence and inadequate cognitive processes and abilities and increase performance deficits (Borkowski & Kurtz, 1987; Borkowski et al., 1987; Borkowski et al., 1990; Carr et al., 1991; Day et al., 1992; Haywood & Switzky, 1986; Schultz, in press; Schultz & Switzky, 1993; Switzky & Haywood, 1984; Switzky & Heal, 1990; Switzky & Schultz, 1988). Haywood (1992) has described the negative results of

such cognitive/motivational processes in persons with mental retardation and concluded that "being mentally retarded makes one more so". Following upon the emergence of General Strategy Knowledge, Metamemory Acquisition Procedures (MAPs) develop. MAPs are those aspects of information processing that allow children to make executive strategy-deployment decisions. MAPs supply regulating processes useful in implementing and modifying the use of specific strategies, and are important in the development of self-regulation involving checking, monitoring, and revising a strategy's effectiveness. MAPs allow the on-line regulation and monitoring of strategies, so that effective and efficient strategies are maintained but strategies detected as ineffective and inefficient are discarded.

Borkowski et al. (1990, 1992) believe that General Strategy Knowledge, and its associated motivational factors are bidirectionally reciprocally related, each contributing to the other component. High self-esteem, an internal locus of control and the tendency to attribute success to effort are the consequences of a history of consistent, successful, strategy-based habits of responding to learning and memory tasks. Good performance following strategy use strengthens General Strategy Knowledge, which promotes positive self-esteem and attributions of success to effort rather than to uncontrolled factors such as ability or luck. Positive self-esteem and effort-related attributional beliefs enhance the likelihood of strategy generalization. Ineffective motive systems can impair children's basic abilities to develop Specific Strategy Knowledge, especially if children have doubts about their learning abilities. Further, such self-doubts may lead to an impoverished General Strategy Knowledge base, which may limit the acquisition of new learning strategies and higher-level processes that guide the implementation of lower-level strategies. Motivational factors play a pivotal role in subsequent "spontaneous" strategy use by providing incentives necessary for deploying strategies, especially on challenging transfer tasks.

McCombs and her colleagues (McCombs, 1987; McCombs & Marzano, 1990) have long suggested that the self-system promotes children's progress toward self-determination by influencing the processing, transformation, and encoding of information. Children with positive self-concepts, along with effort-related attributions (among other self-system constructs), are likely to store and use newly learned information in such a way as to maximize the later usefulness of that information. Children with dysfunctional self-systems, on the other hand, are unlikely to take full advantage of new information.

Harter (1986) found that individuals develop good or poor self concepts depending on the amount of discrepancy between their actual performance and their perceptions of the importance of the task. Thus the self-system and cognitive system are closely intertwined.

One way the self-system alters information processing is by determining how children perceive and integrate new information with existing knowledge in the same (and related) domains. Although perceptions of information may reflect certain global traits of the child, it also appears that children process new information in terms of task-specific relationships in concert with other self and metacognitive system constructs. Marsh (1990) found that math and reading self-concepts were unrelated despite correlations between math and reading achievement scores. Abhalter and Switzky (1992) found similar results in their sample of elementary aged nonhandicapped children. Such task-specific perceptions may be due to a maturing self-system which make it easier for the child to develop positive self-esteem, and accompanying metacognitive knowledge about specific tasks and strategies. (The results of the Peabody-Vanderbilt group with mentally retarded and preschool-aged children have shown that these populations show much less domain-specificity in the organization of their self-systems which is to expected in individuals with less developed and less matured self-systems).

Weiner (1990) has commented on the renaissance of research between affect and cognitive processes. Affective responses to task demands and task outcomes are a product of, and reinforce the development of, the self and metacognitive systems by modifying affective states, such as joy, pride, or sadness. Pride is enhanced by perceptions of personal causality (Weisz, 1978), when success is perceived to be the result of a combination of high ability and effort (Covington, 1987). Shame, guilt and anxiety are enhanced when one believes that one's performance is indicative of low effort and low ability (Covington, 1987). Affective responses to success and failure are another cognitively linked component to the information processing system. Children respond emotionally to their performance outcomes which either support or undermine their metacognitive and cognitive development depending on the resultant self-perceptions. Attributional beliefs regarding success and failure also effect emotions and the subsequent development of metacognitive and cognitive processes. Attributing success to internal factors promotes pride and happiness (Stipek & Weisz, 1981). Failure attributions, (i.e., the

belief that one is personally unable to manage events that others seem able to control), following failure performance despite high effort, influence one's self-worth and causes such emotions as self-blame, humiliation, and self-derogation (Covington, 1987), which in turn leads to decreasing expectancies, and the avoidance of failure, resulting in an inhibited and deficit development of metacognitive and cognitive processes.

Borkowski et al. (1990, 1992) building on the older information processing models of Pressley et al. (1985) and Borkowski et al. (1987) have developed a model of performance integrating metacognitive and motivational constructs. From the perspective of the Borkowski et al. (1990) metacognitive model, children who feel good about themselves and their ability (e.g., those who are intrinsically motivated to learn and who have effort-related attributions), are more likely to believe in strategic behavior and to develop complex, mature strategy knowledge. Self-system constructs energize metacognition by giving children the resolve to learn. Attributional beliefs are of particular importance for metacognitive development because children must first believe in the utility of their strategy-related effort (Clifford, 1984) before they will apply those efforts in situations that demand strategic behavior. Effort is actualized in the form of well-chosen strategies that are carefully and thoughtfully applied to difficult tasks. Children with positive self-systems are more likely to acquire specific strategy knowledge, and to apply this knowledge on new tasks because they have a general belief in the utility of strategies and effort (i.e., they have a well developed general strategy knowledge component in their metacognitive system). Emotional responses to success or failure also influence the development of metacognition. Children who have a sense of pride in their work and who seek success as a function of their effort, are more likely to acquire and use metacognitive knowledge, and seek challenging experiences to increase these feelings of pride and self-fulfillment because of early successful strategic behavior that lead to positive attributional patterns. Later these attributional patterns concerning controllability (self-determination) influence whether these children persist in strategic behaviors when they initially are unsuccessful. Thus children who feel good about themselves as learners are more likely to continue to be strategic and to increase their metacognitive knowledge because these behaviors have been successful in the past, enhancing performance and increasing self-esteem.

Though it is the self-system which provides the motivational thrust in order for the child to become self-determining, it is the metacognitive system that provides the processes to reach that goal. For the metacognitive system to function efficiently, children must have adequate information about both general and specific strategy knowledge (about why, when, where, and how to use strategies). Personal-motivational processes (e.g., intrinsic-motivation, self-determination, effort-related attributions) are useless to individuals who do not have the necessary accompanying specific strategic knowledge. Such individuals will have be highly motivated to use the appropriate strategies but will not know how to select the ones to use for particular task demands. Intervention programs for deficient and mentally retarded learners must have a dual focus: the development of personal-motivational self-system processes as well as the development of the metacognitive system in order to maximize learning and performance.

Borkowski et al. (1992) illustrate the developmental pattern of the reciprocal interrelationship between personal-motivational factors and metacognitive factors in the development of self-regulation in the following example:

1. A child is initially taught to use a learning strategy and with repetition, comes to learn about the attributes of that strategy (specific strategy knowledge). These attributes include the effectiveness of the strategy, the range of its appropriate applications, and the effort required in using it.

2. Other strategies are learned and repeated (specific strategy knowledge is enlarged and enriched).

3. The child gradually develops the capacity to select strategies appropriate for some tasks (but not others) and to fill in the gaps by monitoring performance), especially when essential strategy components have not been adequately learned. At this stage, higher order executive processes emerge. This is the beginning of self-regulation, the basis for adaptive, fully concentrated, motivated learning.

4. As these processes become refined, the child comes to recognize the general utility and importance of being strategic (general strategy knowledge) and beliefs about self-efficacy develop. Children learn to attribute successful (and unsuccessful) learning outcomes to effort expended in

strategy deployment rather than to luck; and they learn to understand that through self-directed actions mental competencies can be enhanced. In this way, the metacognitive model integrates cognitive acts (in the form of strategy use) with their motivational causes and consequences. A sense of self-efficacy and an enjoyment of learning flow from individual cognitive actions and eventually return to energize strategy selection and monitoring decisions (i.e., executive processes). It is this later connection, the association between the learner's reasons for learning and the deployment of self-regulation, that has been absent from most instructionally-based strategy training programs.

5. General knowledge about the world as well as domain-specific knowledge (e.g. reading) accumulate. Such knowledge, is often sufficient to solve problems even without the aid of strategies. In these situations, metacognitive processes are often unnecessary, although motivational components remain important.

6. Crystallized visions into the future help the child to form a number of flexible "hoped-for" and "feared" possible-selves, providing the impetus for achieving important short-term as well as long-term goals, such as becoming a "competent student" in order to eventually become a "successful lawyer". In this way, the self-system takes on a futuristic perspective providing incentives for the operation of the entire metacognitive system. To teach the child to believe in oneself is based on the work of Markus and her colleagues (Cantor, Markus, Niedenthal, & Nurius, 1986; Markus & Nurius, 1986; Markus, Cross, & Wurf, 1990) and their theory of "possible selves". Possible selves, are visions of ourselves in future states. Each of us have hoped-for selves (e.g., the famous me, the wealthy me, the lawyer me), feared-selves (e.g., the lonely me, the alcoholic me), and expected-selves (e.g., me the college graduate). These individualized, long-range visions motivate behavior in the present; we work in the present to achieve our hopes and future expectations and to avoid our fears in order to reduce the distance between our current true self and the possible self that one aspires to become (Day et al., 1992). Markus' theory of possible selves becomes a casual factor in the development of children who have an incremental theory of ability (Elliot & Dweck, 1988). Possible selves represent goals and so once a child imagines a future self, this represents an important step toward self-regulation. Markus' theory suggests that as part of the motivational self-system, that teachers induce children to believe

that they can become good strategy users, that the good strategy user is a "possible self", and that good strategy use in various curricula areas is the basis for various "hoped-for selves". If children can be led to believe that acquiring academic strategy and problem-solving skills are important to their becoming their "hoped-for self", their self-esteem, their self-confidence, their self-determination, and their intrinsic-motivation should also increase. Given the many real-world reinforcements for literacy and numerical competence, motivation to learn new skills should be heightened. Thus the cycle of acquiring competent strategies affects motivational and self-esteem, which jointly fuel new learning, intrinsic motivation, and the facilitation, generalization, and modification of strategies. Unfortunately, many learning deficient students fail to perceive how strategies, and academic achievement in general are relevant to their long-range goals, their dreams and expectations for the future.

Borkowski et al. (1990, 1992) model of motivation and metacognition postulates that the development of the metacognitive system is dependent on the individual's initial acquisition of appropriate attributions, intrinsic motivations, and affective states which are acquired from their families and their early school experiences. Successful students believe that their effort is instrumental in producing their success. Unsuccessful students, have immature, inaccurate beliefs about their own successes and failures, usually attributing their successes to luck and their failures to a lack of abilities resulting in the tendency to avoid strategic behavior in the face of challenging academic tasks. The self-system and long-range personal vision of many children with academic problems are typically underdeveloped, vague, and lack detailed information about the steps necessary to achieve success. These "helpless" children (Dweck, 1975, 1989) often fail to develop functional self-systems that would facilitate their progress through school. The failure to develop a mature self-system, and an efficient set of metacognitive processes, is likely to result in poor performance as well as the reinforcement of negative self-perceptions and negative self-beliefs.

One allusive question regards the relationship of the development of the metacognitive system to the development of the personal-motivational self-system. If self-system development occurs prior to metacognitive development, different developmental patterns among self-system constructs may differentially influence metacognitive development (i.e., self-perception and beliefs may determine the

development of the metacognitive system, Heckhausen (1983)). In nonhandicapped children, having an intrinsic motivational orientation may facilitate the development of metacognitive processes and enhances school performance, whereas in mentally retarded children, having an extrinsic motivational orientation may undermine the development of metacognitive processes and depresses school achievement. There is evidence that different patterns of self-perception and beliefs determine how various subgroups of children (e.g., gifted, learning disabled, and "helpless" nonhandicapped children) perceive task goals, solve problems, and assess the meaning of performance outcomes. There is pitifully very little information regarding the development of the self-system and metacognitive processes in mentally retarded populations presumably due to the difficulties involved with doing research with mentally retarded populations.

In gifted and talented children, an integrated pattern of motivational and metacognitive development due to consistent success, and the encouragement of both families and teachers lead to the emergence of a positive self-concept and superior metacognitive development and high academic achievement (Anastaziow, 1964; Feldman, 1979; Ketcham & Snyder, 1977). In terms of Borkowski et al. (1990, 1992) metacognive theory, gifted children are believed to acquire specific strategy knowledge more efficiently than average children which is associated as well with high self-esteem, intrinsic motivation, and effort-related attributional beliefs. These characteristics of general strategy knowledge, combined with more detailed specific strategy knowledge, promote the development of higher-order metacognitive knowledge (MAPs). It is the establishment of these advanced metacognitive components that is characteristic of gifted and talented children and enables them to invent creative and inventive solutions to problem-solving tasks (Borkowski & Kurtz, 1987).

LD children with organically-based developmental problems, because of their history of failure experiences often develop metacognitive and motivational problems. Jocobsen, Lowery, and DuCette (1986) found that LD children have self-systems that promote low achievement behaviors. Instead of attributing success to effort and failure to external causes, LD children attributed success to external causes and failure to effort, leading to feelings of low self-worth and dysfunctional metacognitive and self-system processes, increasing the likelihood of failure and negative self-evaluations, thus

perpetuating the failure cycle. Children with organic developmental learning deficits may improve their performance if they can modify the operation and the efficiency of their self and metacognitive systems. Douglas (1982) proposed intervention programs for hyperactive and LD children to modify their dysfunctional, cognitive, metacognitive, and motivational processes. Specifically, LD children should be taught to understand that their deficiencies are modifiable, if they are given general problem-solving skills and accompanying attributional and motivational components, and presented specific strategies for a wide variety of tasks. These models of intervention have been successfully applied by Reid and Borkowski (1987) who combined training in both strategy and motivational deficits.

In average ability children, poorly functioning metacognitive and self-system processes can result in learned helplessness (Dweck, 1975, 1989). Helpless children react to failure by removing themselves from the task rather than by intensifying effort or modifying their strategic behavior. These children have a dysfunctional attributional belief system which is organized around the concept that ability, and not effort, is the cause of success, resulting in their failure to apply effort because they believe that it is useless to try. Nonhelpless children, who possess a more advanced metacognitive system are "mastery oriented" and increase their efforts, and presumably utilize and/or acquire metacognive understanding under conditions of learning challenges. Helpless children do not benefit from their learning experiences, whereas mastery-oriented children may gain new insights into the applicability of specific strategies to new situations, resulting in the acquisition of new MAPs, such as knowing how to select the best strategy or how to change strategies when they do not work. Learned helplessness can be analyzed by the Borkowski et al. (1990. 1992) model in terms of dysfunctional attributional beliefs, a component of General Strategy Knowledge. Helpless children have adequate but not advanced specific strategy knowledge, however, they lack strong commitments to strategic behaviors, or the ability to fill in gaps when strategy knowledge is incomplete which is part of the MAPs system. Strategic behavior can be elicited from helpless and nonhelpless average ability children, however, helpless children do not appear to possess the underlying motivational states, attributional beliefs and metacognitive processes (such as MAPs) that support specific strategy knowledge,

particularly under failure conditions. Helpless children do not believe that they will succeed through effort, thus these children are unlikely to develop or to use higher-order executive processes.

Helpless children have an ineffective General Strategy Knowledge metacognitive system. Children with effective general strategy knowledge understand the value of effort in facilitating successful performance, and believe that thoughtful, strategic actions are effective ways to expend effort. Children who are deficient in general strategy knowledge exhibit helpless behavior because they do not believe that effort, in the form of strategic development, will lead to successful performance in challenging situations. Nonhelpless children believe that success is a result of effort and persist in appropriate problem-solving behavior. Learned helpless children in contrast to LD children, appear to be deficient in general strategy knowledge (and MAPs) as well as the motivational and affective states necessary for consistent patterns of academic achievement.

III. A Synthesis Of Motivational Theories For Mentally Retarded Persons: An Agenda for Future Research.

Both the Yale Group and the Peabody-Vanderbilt Group of mental retardation researchers have demonstrated that the performance of persons with mental retardation is a function of the complex interplay of personality and motivational processes within a developmental perspective, as well as the conception of persons with mental retardation as active problem solvers reflecting current mainstream psychological thought. This has facilitated the accelerating integration between a psychology of mental retardation and an overall developmental psychology of human growth applicable to both retarded and nonretarded persons. It can be argued that mental retardation researchers have been historically more sensitive to the impact of personality and motivational processes on the performance of learners with mental retardation and have developed more elaborate models of motivational systems and self-system processes of individual differences compared to other developmental psychologists studying nonhandicapped learners. However, over the last 10-15 years these developmental psychologists as reviewed here have become more concerned with motivational and self-system processes in nonhandicapped learners and have developed very extensive and thoughtful models of motivational self-system processes. These new models of motivation and self-system processes need to be

considered by mental retardation researchers to help them refine their models of motivation and their future research endeavors.

As Weiner (1990) has thoroughly documented, the study of motivation has been confounded with the study of learning without any real interest in developing any cohesive, generalizable models of personality structure. Motivational theorist studying handicapped and nonhandicapped populations each created their own unique measures of their motivational constructs and flatly ignored how their theoretical models related to the theoretical models of other motivational researchers or with other operational definitions of motivation created by other motivational theorists. Currently, developmental motivational theorists studying nonhandicapped populations have seen the error of their ways and have developed more cognitively based theories of motivation based on the interrelated cognitions of casual ascriptions, efficacy and control beliefs, learned helplessness, and the goals for which one is striving for, within the context of a theory of self-system processes, and a theory of intrinsic/extrinsic motivation. Bandura's (1993) most recent formulation of his theoretical model of self-efficacy in this author's opinion is one of the better attempts to deal with the concerns expressed by Weiner (1990). Motivational researchers in the field of mental retardation have to make the same attempts as their colleagues in mainstream psychology to develop more cohesive, generalizable, more highly focused, more theoretically elaborate, and more precise models of motivational systems applicable to persons with mental retardation.

The work of Dweck and Leggett (1988) and the related work of Nicholls (1984, 1989, 1990) concerning the perceptions of the reasons for task engagement, i.e., goal-setting/goal values as a distinction between "learning goals"/"mastery goals"/"task goals" which motivate individuals to engage in tasks in order to develop mastery, understanding, increased competence, and learning new things; and "performance goals"/"ego goals" which motivate individuals to validate one's competence by obtaining positive judgments of ones' abilities (or avoid negative ones) by engaging in tasks in order to do better than others, to demonstrate more intelligence than others, or to win approval from others most be evaluated by motivational researchers in the field of mental retardation as to their theoretical applicability to the motivational systems of mentally retarded persons. Do the belief systems of mentally

retarded learners concerning the nature of intelligence ("smartness"), i.e., smartness as an "incremental" theory where intelligence is viewed as something one can increase or as an "entity" theory where intelligence is viewed as a fixed static trait, operate the same way to change goal structures in mentally retarded individuals as they do in nonhandicapped individuals (Bandura & Dweck, 1981; Dweck, 1989; Nicholls, 1979b, 1983, 1989, Nicholls et al., 1989; Stipek, 1984)?

Bandura's (1991, 1992, 1993) expansion of his social cognitive theory emphasizing the construct of personal agency and perceived self-efficacy stresses the ideas that individuals take responsibility for their actions and impute success and failure to the goals they choose, the resources they mobilize, and the efforts they expend, as well as the idea, that beliefs concerning one's self-perceptions of one's capabilities to organize and implement actions necessary to attain designated levels of performance establish one's expectations and motivation have tremendous implications for motivational researchers in mental retardation. The Peabody-Vanderbilt group has been heavily influenced by more preliminary versions of Bandura's social cognitive theory and this author expects that the Peabody-Vanderbilt will attempt to refine its models of motivation in persons with mental retardation by integrating aspects of Bandura's expanded theory which has been so successful in accounting for behavioral outcomes in both nonhandicapped children and adults in so many different domains of performance. Additionally, Bandura (1993) has tried to integrate his social cognitive theory of self-regulation of motivation to the major mainstream psychological motivational theories dominating the current zeitgeist: attribution theory and casual attributions, expectancy-value theory and outcome expectancies, and goal theory and cognitized goals, in an attempt to lead the way to develop cohesive, generalizable models of personality structure and self-regulation. These attempts by Bandura surely need to be considered by all motivational researchers in the field of mental retardation in order to develop better motivational theories for persons with mental retardation.

Motivational theorists such as Decharms (1976, 1984), Deci and his colleagues (Deci, 1975; Deci & Ryan, 1985, 1991; Ryan & Connell, 1989; Ryan, Connell, & Deci, 1985), and Leeper and his colleagues (Leeper & Hodell, 1989), focus on motivational constructs such as autonomy and self-determination. They believe that individuals engage in activities by their own volition and endorsed by

ones' sense of self, rather than to achieve some external reward or to avoid some external punishment. Individuals are intrinsically motivated when they perceive themselves as the cause of their own behavior (i.e., as possessing personal causation, having an internal locus of causality, having a feeling of choice), where they can experience themselves as casual agents and to view themselves as the originators of their own behaviors rather than pawns to external forces. Additionally, intrinsically motivated individuals have strong needs for a sense of competence, self-determination and challenge. Individuals are extrinsically motivated when they believe they are engaging in behavior because of controlling external environmental demand conditions (e.g. external reinforcers, external constraints, pleasing another person, and having an external locus of causality). These researchers have found that the demand conditions of the environment influence the individual's intrinsic motivation. "Informational" environments convey relevant information to the individual about competence at a task, thus supporting self-autonomy and intrinsic motivation. "Controlling" environments designed to bring about a particular behavioral outcome usually by the use of extrinsic rewards, support dependency and extrinsic motivation in the individual by shifting the individual's perception away from autonomy and personal causation and toward a perception of external causation which undermines intrinsic motivation. Motivational researchers in the field of mental retardation need to apply these principles to mentally retarded persons and the environments which mentally retarded persons inhabit to determine the degree of informational and controlling components of the environment and ways in which one can facilitate the development of intrinsic motivation. Can one increase the informational qualities of the environment and decrease the controlling qualities of the environment to increase intrinsic motivation in persons with mental retardation?

Both the Yale Group and the Peabody-Vanderbilt Group of mental retardation researchers (Haywood & Switzky, 1986, 1992; Merighi, et al, 1990; Zigler & Hodapp, 1991) very early in the development of their theoretical models believed strongly that the performance of mentally retarded persons reflected the interaction of intrinsic motivation and cognitive processes. Over the last ten years this theme has increasingly dominated both motivational researchers and cognitive researchers deriving from the mental retardation tradition (Borkowski et al., 1992; Feuerstein et al., 1991; Haywood &

Tzuriel, 1992) as well as motivational and cognitive researchers from developmental psychology (Bransford & Stein, 1988; Brown, 1978; Brown & Palinscar, 1987; Dweck, 1986; Harners et al., 1993; Maehr & Pintrich, 1991; Nicholls, 1989, 1990; Paris & Byrnes, 1989; Paris & Newman, 1990; Pressley et al., 1984, 1985; Sternberg, 1985; Vye et al., 1988; Wigfield & Karpathian, 1991; Zimmerman, 1990). The efficient operation of cognitive processes and ability systems is vitally linked to motivational processes.

Only when personal-motivational processes are included in strategy training interventions will strategy generalization become facilitated. Strategy-based actions directly influence the self-concept, attitudes about learning, and attributional beliefs about personal control. In turn, these personal-motivational states determine the course of new strategy acquisition and, more importantly, the likelihood of strategy transfer and the quality of self-understanding about the nature and function of mental processes. Borkowski and his collaborators (Borkowski et al., 1992) have developed a new model of strategy-based intervention strongly linked to self-regulatory motivational and personality processes which has great relevance for both handicapped and nonhandicapped learners. These models provide a foundation and a new agenda for research regarding problem-solving acquisition and usage in persons who are mentally retarded. Most interesting is the view of Markus and her colleagues (Cantor, Markus, Niedenthal, & Nurius, 1986; Markus & Nurius Nurius, 1986; Markus, Cross, & Wurf, 1990) and their theory of "possible selves" which are visions of ourselves in future states. In Borkowski's new theory (Borkowski et al., 1992), these "hoped-for" and "feared posible-selves" provide the impetus for achieving important short-term and long-term goals. In this way the self-system takes on a futuristic perspective providing incentives for the operation of the entire metacognitive system. This author looks forward to the further testing and refinement of these models for mentally retarded learners.

A major problem for mental retardation researchers who study motivational, personality and self-system processes in mentally retarded and low-mental age persons has been the dearth of psychometric instruments and techniques with adequate construct validity. The author has argued vigorously for the construct validity of the Picture Motivation Scale as a measure of intrinsic/extrinsic

motivation in mentally retarded and low-mental age populations (Switzky & Heal, 1990) and has documented in this chapter the evidence to support these claims. The Yale Group has invented operational definitions for their major motivational constructs of positive reaction tendencies and overdependency, negative reaction tendencies and weariness, expectancies of success and failure, outerdirectness, effectance motivation, self-concept deficiencies, and high anxiety. However better measures of personality, self-regulatory and motivational processes are needed to develop more fine-grained and refined theoretical models applicable to mentally retarded and low-mental age populations which are better integrated with motivational and personality theories of self-system processes derived from mainstream developmental psychology.

There are very few instruments for nonhandicapped children below 8 years of age having even moderate predictive validity: (a) Piers and Harris's Children's Self-Concept Scale (Piers & Harris, 1969), (b) The Children's Manifest Anxiety Test (Castaneda et al., 1956), (c) The Test Anxiety Scale for Children (Sarason et al., 1960), (d) The Scale of Intrinsic Versus Extrinsic Orientation in the Classroom (Harter, 1981b) and its revision for mildly mentally retarded children (Silon & Harter, 1985), (e) The Perceived Competence Scale for Children (Harter, 1982b), and (f) The Children's Academic Intrinsic Motivational Inventory (Gottfried, 1985) and its downward extension, The Young Children's Academic Intrinsic Motivation Inventory (Gottfried, 1990). Nicholls has developed a set of instruments to measure task goal/learning goals (Nicholls, 1989, 1990; Nicholls et al., 1990) in children which may have application to low-mental age and mentally retarded individuals. Bandura and his colleagues have developed new measures of self-efficacy (Bandura, 1993; Capara et al., 1992) which may also be very promising for mental retardation researchers. Deci and his collaborators (Deci & Ryan, 1985; Deci et al., 1991; Ryan, 1991; Vallerand, 1991) have expanded their theory of self-determination by developing measures of an autonomous continuum of extrinsic/intrinsic motivation (e.g., external regulation, introjected regulation, identified regulation, and integrated regulation) related to how successfully an optimal self-regulatory style of intrinsic motivation has been internalized and integrated into the self. Ryan and Connell (1989) designed The Academic-Self-Regulation Questionnaire (ASRQ) for students

in elementary and middle school. These measures of regulatory style may also be fruitful for mental retardation researchers to adapt for lower mental-age populations.

Zigler and his colleagues (Burack et al., 1988; Merighi et al., 1990; Zigler & Burack, 1989; Zigler & Hodapp, 1991; Zigler & Glick, 1986) raise the question concerning the interaction of different motivational and cognitive patterns in familial, organic, dually diagnosed psychiatric disordered, and genetic (ie, etiology-specific) populations of developmentally disabled learners and argue that etiology, independent of psychometric intelligence is an important predictor of performance. There may exist etiology-specific motivational behavioral profiles which need to be investigated by mental retardation motivational researchers (Dykens, Hodapp, & Finucane, 1993; Hodapp & Dykens, in press; Stoel-Gammon, 1990). Individual differences have been identified concerning the behavior and development of persons with Downs Syndrome (Cicchetti & Beeghly, 1990; Dykens, Hodapp, & Evans, 1992; Wagner, Ganiban, & Cicchetti, 1990), fragile X syndrome (Dykens & Leckman, 1990; Pennington, O'Connor, & Sudhalter, 1991), autism (Cohen & Donnellan, 1987), Smith-Magenis syndrome (Greenberg, Guzzetta, Montes de Oca-Luna, Magenis, Smith, Richter, Kondo, Dobyns, Patel, & Lupinski, 1991) and Prader-Willi Syndrome (Taylor & Caldwell, 1988). There may exist dramatic differences in motivational and personality self-system processes in these different etiologic groups as well (Bregman, 1991; Bregman, Dykens, Watson, Ort, & Leckman, 1987; Bybee & Zigler, 1992; Dykens, Hodapp, & Leckman, in press; Yando, Seitz, & Zigler, 1989).

Motivational mental retardation researchers need to develop a theoretical model of the ontology of personality and motivational self-system processes and their relationship to learning and achievement in persons with mental retardation. A social developmental theory and perspective needs to be developed and refined to insure that every mentally retarded child and adult acquires and uses their optimal problem solving stategies and their total fluid intelligences. A running start to achieve these goals has been made by both the Yale and Peabody-Vanderbilt Group of mental retardation researchers. Future mental retardation researchers building on the models of both mainstream developmental psychologists and developmental psychologists deriving from the mental retardation tradition are in a strong position to further accelerated the integration between a psychology of mental

retardation and an overall developmental psychology of individual differences in human growth and development applicable to both retarded and nonretarded individuals.

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